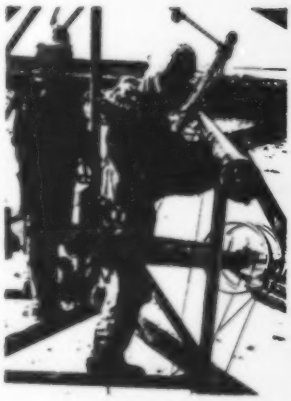
The Manitoba Hydro-Electric Board

39th ANNUAL REPORT FOR THE YEAR ENDED MARCH 31, 1990



manitoba hydro

COVER:

It has been recognized that the production of electricity in quantity involves altering our environment to some degree. Manitoba Hydro recognizes the requirement for environmentally acceptable energy development for present and future generations of Manitobans. It is a challenging task to remain in harmony with nature while meeting the electricity needs of Manitobans. It is a challenge that the Corporation willingly accepts, with optimism about our ability to succeed.

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HIGHLIGHTS

Financial

Gross Revenues
$664.1 million

Total Expenses
$639.9 million

Net Income
$24.2 million

Extraprovincial Revenues
$60.1 million

Energy Sales within Manitoba
$596.9 million

Finance Expense
$241.9 million

Reserves
$116.6 million

Additions to Fixed Assets
$426.9 million

Operating

(Integrated system)

Total Generation (including isolated stations)
19.1 billion kilowatt hours

Manitoba Firm Energy Supplied
17.3 billion kilowatt hours

Manitoba Peak Load
3 631 000 kilowatts

(Manitoba Hydro)

Total Hydraulic Generation
17.6 billion kilowatt hours

Power Sales to Manitoba Customers
14.4 billion kilowatt hours

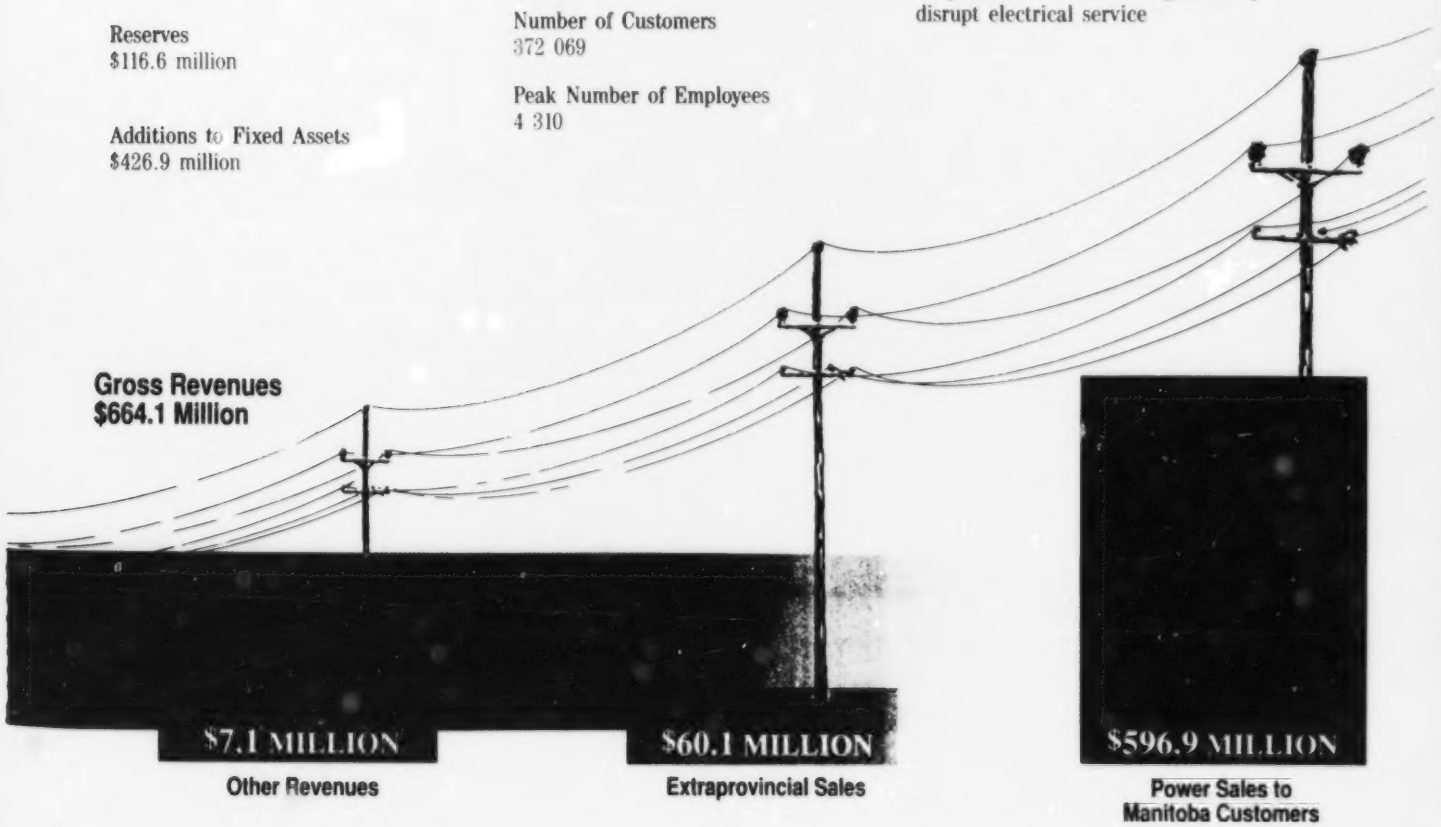
Extraprovincial Sales
3.1 billion kilowatt hours

Number of Customers
372 069

Peak Number of Employees
4 310

Other

- the announcement of a four-point electricity supply plan to meet the needs of Manitobans into the 21st century
- after two successive years of losses due to drought, the Corporation recovered to record a net income of $24.2 million
- a new record peak load of 3 631 000 kilowatts was established, an increase of 6.6 per cent over last year
- the announcement of plans to upgrade diesel generators in six remote communities to increase electrical service to 60 amperes
- widespread forest fires during the year caused substantial work for the Corporation but did not significantly disrupt electrical service



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Power Sources and High Voltage Transmission (map) **inside back cover**

LETTER OF TRANSMITTAL

July 31, 1990

The Honourable Harold Neufeld
Minister responsible for the Administration
of the Manitoba Hydro Act
Legislative Building
Winnipeg, Manitoba
R3C 0V8

Dear Minister:

I have the honour of presenting the 39th Annual Report of The Manitoba Hydro-Electric Board together with financial statements for the fiscal year ended March 31, 1990.

Respectfully submitted,

A. Brian Ransom
Chairman
The Manitoba Hydro-Electric Board

CORPORATE PROFILE

Manitoba Hydro is a Crown Corporation owned by the provincial government. It produces electricity by operating 11 hydraulic generating stations, two thermal generating stations and 13 diesel sites, and distributes power to 372 000 customers throughout Manitoba.

The mandate of the Corporation as established by the Manitoba Hydro Act is "to provide for the continuance of a supply of power adequate for the needs of the province, and to promote economy and efficiency in the generation, distribution, supply and use of power".

Manitoba Hydro distributes electricity throughout the province except for the central portion of The City of Winnipeg.

The Board, currently 10 members, is appointed by the Provincial Cabinet to direct the business of the Corporation. Through its Chairman, the Board reports on the activities of Manitoba Hydro to the Minister responsible for the administration of the Manitoba Hydro Act who, in turn, reports to the Legislative Assembly. In this manner, Manitoba Hydro is responsible to the people of Manitoba through their elected representatives.

Just over 4 000 employees are involved with Manitoba Hydro's generating, transmission and distribution system. The Corporation's fixed assets have a cost of approximately $5 billion.

The Corporation's Head Office is in Winnipeg. In addition, three Regional offices and 74 area offices serve the needs of its customers.

THE MANITOBA HYDRO-ELECTRIC BOARD

The Manitoba Hydro-Electric Board, from left to right, Clyde R. McBain, Kenneth S. Patino, William E. Cheater, Harold J. Perkins, John S. McCallum, Vice-Chairman, A. Brian Ransom, Chairman, Darlene Hildebrand, and Rod J. Beaudry. Absent when photo was taken were Charles E. Curtis and Edmund Kuffel, shown below.

Charles E. Curtis

Edmund Kuffel

A. Brian Ransom
Chairman

John S. McCallum
Vice-Chairman
Faculty of Management
University of Manitoba

Rod J. Beaudry
Production Division
Manitoba Hydro

William E. Cheater
Regional Services Department
Manitoba Hydro

Charles E. Curtis
Deputy Minister of Finance
Province of Manitoba

Darlene Hildebrand
Investment Advisor
RBC Dominion Securities

Edmund Kuffel
Faculty of Engineering
University of Manitoba

Clyde R. McBain
President and General Manager
Ancast Industries Ltd.

Kenneth S. Patino
General Engineering Division
Winnipeg Hydro

Harold J. Perkins
Office of Extension
Brandon University

THE EXECUTIVE

From left:

R.O. (Ralph) Lambert,
Executive Vice-President;

R.B. (Bob) Brennan,
President and Chief Executive Officer.

From left:

R.M. (Murray) Fraser,
Senior Vice-President;

J.F. (John) Funnell, Q.C.,
General Counsel and Corporate Secretary.

Back row, from left:

P.R. (Paul) Thompson,
Vice-President Facilities Planning;

D.L. (Dennis) Riehl,
Vice-President Personnel and Services;

W.J. (Will) Tishinski,
Vice-President Customer Service.

Front row,

D.A. (Don) Kilgour,
Vice-President Engineering and Construction.

CHAIRMAN'S MESSAGE

The Manitoba Hydro Act states that Hydro's mandate is "to provide for the continuance of a supply of power adequate for the needs of the province, and to promote economy and efficiency in the generation, distribution, supply and use of power".

That statement was first enacted into law several decades ago when social, economic and environmental circumstances were much different than today. It is, therefore, the responsibility of The Manitoba Hydro-Electric Board to interpret the intent of the Act in full knowledge of society's present day values.

Consequently, the Board conducted an extensive review of our mandate during the past year and has provided some new direction and emphasis for the 1990s.

Our commitment to public accountability was given greater meaning this past year when the Provincial Government endorsed our request for a public review of our long-term capital plans by empowering the Public Utilities Board to conduct such a review. Hydro regards this as being a very significant component of public accountability.

Being responsive to public demands is also part of accountability and one of the clearest messages ever to emerge from public debate and comment is that we must all do more to preserve our environment. Accordingly, Hydro has made a commitment to apply principles of sustainable development to our activities. While the concept is not yet clearly defined, the intent is clear and Hydro will place much more emphasis on this matter than ever before.

A significant step in this direction was taken in September 1989 when the Board adopted a target of 100 megawatts of savings through demand side management by the year 2001. The practical impact of this decision will be to substitute conservation for building new supply with the result that construction of another generating facility will be delayed by at least one year.

The Board also adopted as policy the position that every community in Manitoba is entitled to get a basic level of electrical service sufficient to operate all appliances and devices with the exception of electric heating. This policy will ultimately result in all remote communities in northern Manitoba presently having 15 ampere service provided by diesel generation, receiving at least 60 ampere service either by expanded diesel generation or by connection to the main system.

Consistent with the Board's policy of treating people affected by Hydro's activities fairly and equitably, the Board supported a request from the Provincial Government to review the impact of the Grand Rapids hydroelectric development upon the people of the forebay area. I am hopeful that negotiations will lead to a full and final settlement of long-standing grievances related to this development.

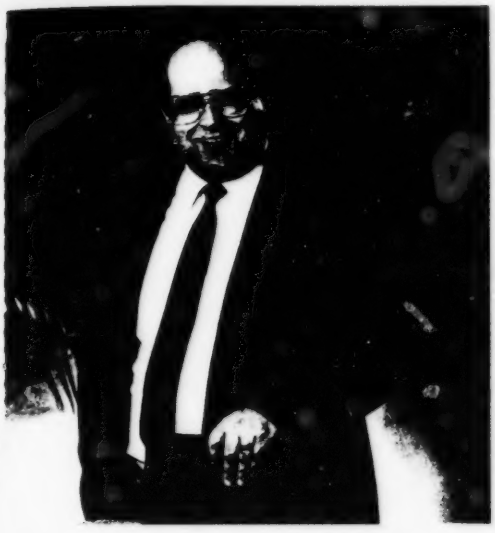
Similarly, the Corporation engaged in intensive negotiations with all parties to the Northern Flood Agreement in an effort to achieve full implementation of the agreement and settlement of outstanding issues related to the Churchill River Diversion, Nelson River Development and Lake Winnipeg Regulation. Significant progress had been made by fiscal year-end.

The Board is proud of the reputation for good service which Hydro enjoys, but has directed that additional emphasis be placed upon individual customer satisfaction. Our monopoly situation demands extra sensitivity to customer requirements.

On behalf of the Board, I wish to express sincere thanks to all those who have assisted us in our deliberations and to all those who have helped the Corporation fulfill its mandate during the past year.

A. Brian Ransom
Chairman

PRESIDENT'S MESSAGE



The fiscal year 1989-90 was an eventful and productive year for Manitoba Hydro. Notwithstanding the drought which continued to have a detrimental impact on operations, the Corporation recorded a net income of $24.2 million for the year ended March 31, 1990. This followed two consecutive years of drought-induced losses totalling close to $45 million.

Energy distributed to Manitoba consumers amounted to nearly 16 billion kilowatt hours, up about 1.3 per cent from the previous year. Manitoba Hydro's total revenues increased by about 9 per cent to $664 million while total expenses increased by less than 1 per cent to $640 million. The substantial revenue increase and the modest expense increase were partly attributable to some improvement in water flow conditions during the year. Hydraulic generation from the integrated system increased by about 23 per cent to 18.7 billion kilowatt hours while thermal generation decreased by 50 per cent to 0.4 billion kilowatt hours. Despite this improvement, hydraulic generation was still approximately 12 per cent lower than what could be expected in a year of median inflows to reservoir systems.

Construction at the Limestone Generating Station on the Nelson River continued ahead of schedule and under budget. First power from Limestone will be delivered to the integrated system during 1990. When fully operational in 1992 at an estimated cost of $1.52 billion, Limestone will add capacity of 1 280 megawatts to the existing hydraulic system capacity of approximately 3 500 megawatts.

In order to prepare Manitoba Hydro for the decade of the 90s and beyond, management and the Board undertook several initiatives in 1989. Among these initiatives were:

- a 1 000 megawatt sale to Ontario Hydro commencing in the year 2000 and extending for 22 years;
- a 300 megawatt diversity exchange (150 megawatts each with Northern States Power and United Power Association) starting in 1995 and extending for 20 years;
- a thermal generating plant life assurance program; and
- a 100 megawatt demand side management program.

The benefits from these initiatives will allow for significantly lower consumer rates than otherwise would have occurred and they will also provide Manitoba Hydro with increased system security and additional access to surplus energy markets.

Looking to the shorter-term future, the quality of Manitoba Hydro's service to customers will assume even greater importance in the 90s. At Manitoba Hydro, we are dedicated to providing a safe and reliable supply of low cost electricity with minimal impact on the environment. While achieving this objective with a commitment to effective cost management and operational excellence, Manitoba Hydro will intensify its efforts towards satisfying customers' individual electrical energy requirements.

Financially, there is a requirement to improve the Corporate reserve position and I am confident that this can be achieved without onerous rate increases to power consumers. In fact, over the longer term, I fully expect that there will be a decrease in the inflation-adjusted price of electricity in Manitoba.

The success of any organization in today's rapidly changing business and technological environment is largely dependent on the competence and resourcefulness of its employees. At Manitoba Hydro, we are richly endowed with an outstanding group of employees and I thank them for their efforts during the year. I would also like to thank the Chairman and Members of the Board for the guidance and leadership which they have provided in directing the affairs of the Corporation.

As the new President and C.E.O., I look forward to the many challenges and opportunities that will undoubtedly confront the Corporation in the decade of the 90s.

R.B. Brennan
President and Chief Executive Officer

CUSTOMER SERVICE

Electric utilities generally have a strong tradition of dedication to customer service and Manitoba Hydro is no exception in this regard. Part of this tradition stems from the basic and vital role of electricity in our society and the need to maintain a continuous supply to customers, such that the frequency of service interruptions is kept to a minimum and service is restored as quickly as possible following any outages.

High quality customer service can only be maintained through our employees' continued commitment to the attainment of this goal.

During the 1989-90 fiscal year, the number of Manitoba Hydro customers grew by 4 411, an increase of 1.2 per cent to a total of 372 069. Residential customers grew by 1.3 per cent to reach 325 727. General Service and miscellaneous customers totalled 46 342 at March 31, 1990, an increase of 0.8 per cent over last year.

Demand Side Management

Manitoba Hydro is involved in some long standing programs intended to encourage the efficient use of electricity.

An early summer windstorm in the beach and resort areas of Lake Winnipeg resulted in substantial damage to Manitoba Hydro lines in the area. Here Dean Sherritt (on roof) and Joe Johnson inspect the mast at a cottage at Lester Beach before reconnecting service.

In addition to these programs, a more comprehensive approach to reducing customer demand for electricity is being developed as a means of delaying the construction of additional sources of generation. These types of programs are known as Demand Side Management.

Manitoba Hydro has established a target reduction in the load forecast of 100 megawatts of electricity by the year 2001. An example of the type of program that may take place is one that the Corporation initiated in the 1989-90 fiscal year, when it offered a $5.00 rebate to customers who purchased outdoor timers.

The timers lower energy consumption and reduce the peak load for the utility.

More than 6 000 rebates were provided under this program.

Manitoba Hydro experts also work with Manitoba industries to provide them with the latest information about new electrotechnologies. Electrotechnologies are new techniques and devices that allow increased energy efficiency in industrial processes.

In November 1989, Hudson Bay Mining and Smelting Co. Limited (HBM&S) Flin Flon Division was presented with the Regional Industrial Energy Efficiency Award by Manitoba Hydro and the Canadian Electrical Association. Since 1984, HBM&S has implemented a large number of energy management measures which, in the last two years, have resulted in an average annual decrease of 4.3 per cent in energy usage and a 9.8 per cent decrease in electrical demand.

In a program called Home CHEC-UP, specially trained energy advisors inspect residences to assess their energy efficiency and provide advice to customers on improvements. These are

Hudson Bay Mining and Smelting Co. Limited in Flin Flon won the Regional Industrial Energy Efficiency Award for its efforts in implementing energy management measures at its Flin Flon facility. The award is sponsored by Manitoba Hydro and the Canadian Electrical Association.

Manitoba Hydro Eastern Region Business Manager Clare Nesbitt, centre, is shown at the Manitoba Rolling Mills in Selkirk with MRM employees Allan Heartfield, left, and Trevor Jarvis. In background is the mill's new energy efficient electric arc furnace installed in the 1989-90 fiscal year.

called energy audits. In the past fiscal year, there were 3 656 applications received for energy audits. The Provincial Government funds the Home CHEC-UP program.

Public Accountability

Pursuant to the Crown Corporations Public Review and Accountability and Consequential Amendments Act, Manitoba Hydro has held a series of public meetings around the province to allow the public to comment on the Corporation's policies and practices and the issues facing Manitoba Hydro. In the past year, such meetings were held in The Pas, Neepawa and Winnipeg.

In addition, The Manitoba Hydro-Electric Board continued its practice of holding some of its meetings outside Winnipeg. This year meetings were held in Thompson, Pine Falls, Limestone and Winkler. This practice allows Board members the opportunity to meet with customers and local officials and in so doing, to gain a perspective on regional issues and concerns.

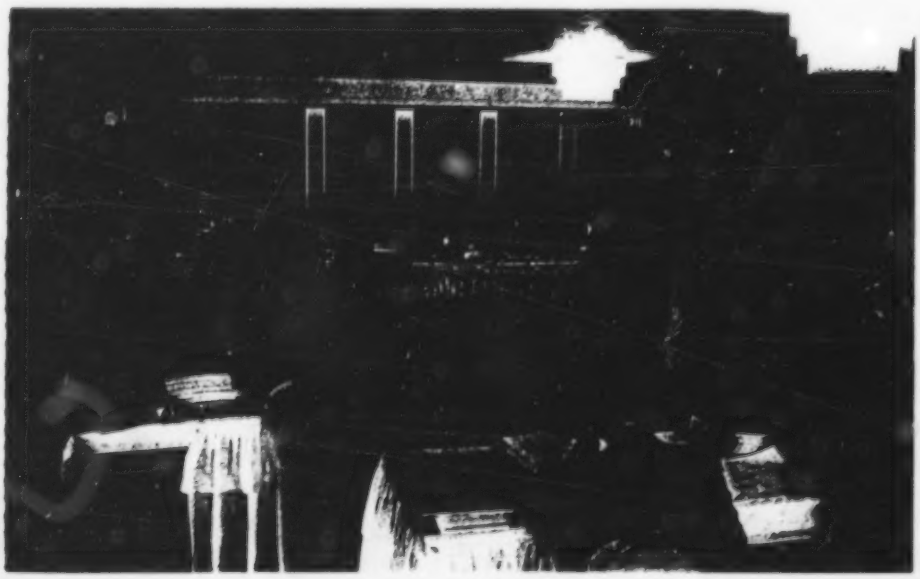
In February 1990, Manitoba Hydro appeared before the Public Utilities Board of Manitoba at hearings in Winnipeg and at a public meeting in Virden in connection with an application for new rates made by the Corporation. It had also attended public meetings in January 1990 in Thompson, The Pas, Pikwitonei and Thicket Portage concerning this application.

Service Area

In order to effectively serve its customers in an area of 650 000 square kilometres, the Corporation divides its service area into three Regions. Each Region is responsible for planning, designing, constructing, operating and maintaining the electrical distribution system in its area. Western Region is headquartered in Brandon, while the Eastern Region office is in Selkirk and the Central Region office is in Winnipeg.

Regional staff have the primary responsibility for dealing with customers and they are the day-to-day contacts for service, billing and most other matters.

Some 1 460 Regional personnel look



Early in 1990, Manitoba Hydro appeared before the Public Utilities Board of Manitoba in Winnipeg to make its application for new electricity rates.

after the needs of the Corporation's 372 069 customers.

More than 49 per cent of Manitoba Hydro's total staff work outside of Winnipeg in some 88 locations.

The five year Rural Underground Distribution Program was completed in 1989-90.

In areas prone to ice storms that damage overhead lines, Manitoba Hydro has buried some of its lines in order to improve reliability and limit future damage.

The Regions are also involved in programs to upgrade rural distribution facilities to allow for increased electrical loads.

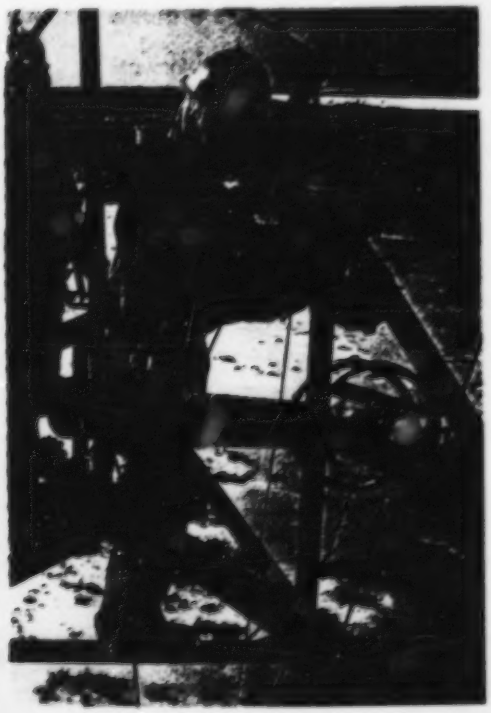
In total, capital expenditures in the Regions aimed at improving service to customers were $50.2 million in 1989-90.

For the second consecutive year, a major windstorm struck in the province, affecting electrical service to a large number of customers, particularly in the cottage areas around Lake Winnipeg.

Forest fires raged through both the northern and southern parts of the province during the summer of 1989. Although residents of many communities were temporarily evacuated from their homes, electrical service interruptions were minimal.

Manitoba Hydro maintains and operates 13 diesel generating sites, providing electricity to isolated communities in northern Manitoba. Negotiations are currently underway with the Federal and Provincial Governments to bring central station service to seven of these communities — Garden Hill, Gods Lake Narrows, Gods River, Oxford House, Red Sucker Lake, St. Theresa and Wasagamack.

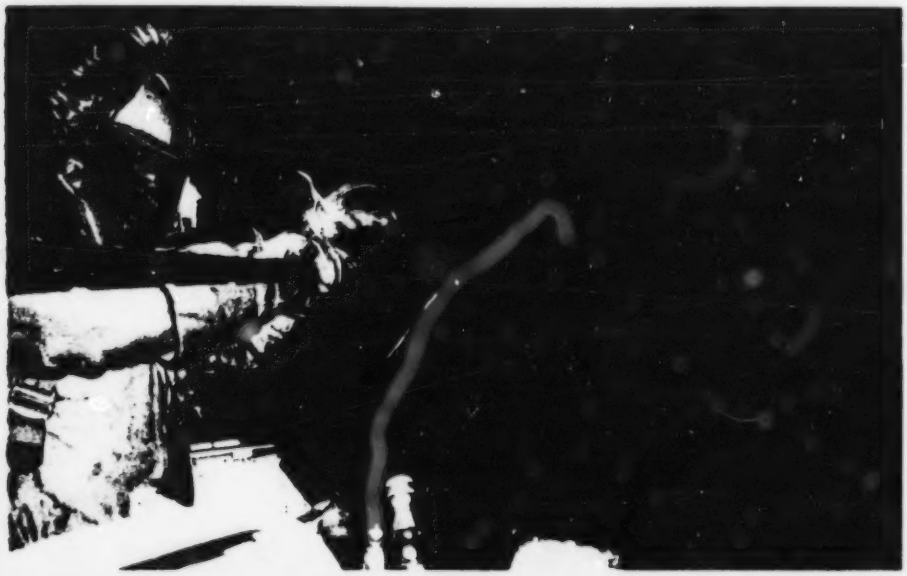
In addition, during the year, the Corporation announced plans to upgrade the diesel generators in the remaining six communities — Brochet, Lac Brochet, Pikwitonei, Shamattawa, Tadoule Lake and Thicket Portage — in order to improve electrical service in these areas. Service is presently limited to 15 amperes and will be upgraded to 60 amperes with the addition of increased diesel capacity. Engineering design work is currently underway and it is expected that the first community will receive improved service during the 1993-94 fiscal year.



Above: During the year, a new district office was opened in Norway House to serve the area. From left, clerks Barb Paupanekis and Karen Mowatt, and District Operator Wes Burton demonstrate the computerized Customer Service System to Norway House Band Council member Betsy Apetagon.

Left: Good customer service means that our production, transmission and distribution facilities are well maintained, ensuring as few interruptions as possible to the supply of electricity. Near Grand Rapids, Manitoba Hydro linemen are shown changing insulators some 70 metres in the air on a high voltage direct current transmission line.

EMPLOYEES



Top: Journeyman Lineman Mark Hanson carries out repairs to a conductor damaged by lightning on the transmission line from Gillam to Churchill. The work was done while the line was energized and the temperature was -30 degrees Celsius.

Above and right: Widespread forest fires in Manitoba during the spring and summer of 1989 did not result in many power disruptions but did cause a great deal of work for Manitoba Hydro as almost 300 burned poles had to be replaced.

The successful operation of Manitoba Hydro depends on its people. Day after day they demonstrate their commitment to maintaining a continuous supply of electricity to the people they serve. All Manitoba Hydro staff share a concern for providing Manitobans with high quality service both now and in the future.

The forest fires that devastated many parts of the province during the summer of 1989 also challenged our employees who worked to maintain service in the affected areas. While service interruptions were relatively few, employees worked in terrible conditions to replace almost 300 poles that had been burned by the widespread fires. In a number of cases, employees remained behind in their communities to maintain service while their families were evacuated to safer areas.

One fire threatened the transformer station and buildings near the Kelsey Generating Station. For almost a week, Kelsey operating staff, reinforced by other employees, fought the

encroaching flames with fire breaks, water hoses and an improvised fire truck and successfully defended the station from any substantial fire damage. Some of the employees involved worked 30 hours without relief in order to ensure the safety of the facilities.

While the forest fires were an exceptional circumstance that Manitobans hope they will not have to experience again soon, the reaction of Manitoba Hydro employees to this emergency typifies their ongoing commitment to the maintenance of the electrical system in the province. Employees also demonstrate their dedication every day in many other, less dramatic ways from restoring service following storms, to responding promptly to a request for a new connection to the network.

During the 1989-90 year, employment at Manitoba Hydro peaked at 4 310 in August 1989, compared to 4 307 last year. The Corporation continues to enjoy the benefits of having a number of long-service employees, including six who completed 40 years of service during the year, 14 who attained 35 years service and 39 who reached the 30-year mark. A further 64 employees were recognized for 25 years of service while 249 were acknowledged for 15 years service with the Corporation. A total of 70 employees retired during the year.

In June 1989, Manitoba Hydro embarked on the development of a new job evaluation system. At present, there are different methods used to evaluate jobs within the various bargaining units and other employee groups. Under the guiding principle of equal pay for work of equal value within each employee jurisdiction, the Corporation intends to apply universal measurement criteria to jobs so that all positions are evaluated equally and as fairly as possible. It is anticipated that a new pay structure model based on this evaluation system will be ready in 1990-91.

In support of Manitoba Hydro's ongoing commitment to employee training and development, a full range of courses and seminars was offered to employees at all levels in the organization. Programs offered during the year covered a wide range of subject areas, including: management and supervisory development, customer service training, and general employee development. Other employees participated in professional and technical training programs conducted outside the Corporation. Many employees took advantage of Manitoba Hydro's tuition rebate program.

Employment Equity

Manitoba Hydro's commitment to employment equity facilitates women, aboriginal peoples, people with physical disabilities and members of visible minority groups becoming an integral part of the work force. This year representation of these groups continued to improve in all occupational areas of the Corporation.

Manitoba Hydro again conferred bursary awards to outstanding students entering fields of study related to our technical operations. In anticipation of future human resource requirements, 13 students from northern native communities participated in a summer work experience program of Line and Electrical Maintenance training.

Recycling

In December 1989, Manitoba Hydro inaugurated a paper recycling program in several of its Winnipeg offices. Employees were asked to sort waste paper into small receptacles in their offices. These receptacles are then emptied into larger bins and removed by a contractor three times a week (or as required) for shredding prior to shipping to paper mills for recycling. During the first five months of the program, employees pitched in to collect more than 25 tonnes of paper for recycling. In addition to Winnipeg locations, several rural offices are now involved with the program with the majority of the remaining offices to be included by the end of June 1990.

SAFETY

The safe use of electricity has long been a central concern for all utilities charged with the generation and distribution of electricity. It is a fundamental part of the Corporation's dealings with customers and basic to the training of staff who will be working in direct contact with electrical equipment.

Manitoba Hydro's work safety record ranked among the top four of 15 major Canadian electrical utilities for the 26th consecutive year. While this type of comparison is useful for the Corporation as a means of measuring its performance in the area of safety, Manitoba Hydro is always looking to improve its safety record since any injury or accident is unacceptable.

The Corporation placed fourth in the category combining normal electric utility operations and heavy construction operations. The number of disabling injuries increased from 8.9 per million hours worked in calendar year 1988 to 10.1 in 1989. Tragically these statistics include one fatality which occurred when a lineman fell to his death from a pole.

Manitoba Hydro ranked second in 1989 in the category of preventable motor vehicle accidents with 2.2 accidents per million kilometres driven.

Manitoba Hydro continues to support an active fire prevention and protection program. The standard of proficiency for members of the Corporation's eleven fire brigades at Manitoba Hydro Generating and HVDC Converter Stations is Level I Industrial Fire Fighter as certified by the Provincial Fire Commissioner's Office.

Damage to Corporate property due to fire was minimal except for the loss of large numbers of poles due to severe, widespread forest fires.

Health education programs for employees continued during the year with a high degree of employee interest and participation. Presentations continue on hypertension, back care, ergonomics in the workplace, cancer, smoking cessation, risk factors in heart disease, hearing conservation and AIDS education.

A major thrust in training was initiated to comply with recent Workplace Hazardous Materials Information and Workplace Health Hazard regulations. More than 1 600 field employees have been trained in the handling and use of hazardous substances.

Manitoba Hydro's 35 joint worker-management Workplace Safety and Health Committees are assuming an ever-expanding role and are continuing to make an important contribution to employee health and safety.

Considerable interest has developed around the subject of electric and magnetic fields associated with transmission lines, distribution lines, electrical equipment and appliances. In order to assist in responding to such enquiries, information brochures are being prepared for distribution to employees and the public.

A strong emphasis on public safety awareness programs continued during the year through the distribution of a variety of printed and electronic media. Safety was also the subject of a number of presentations in schools and at fairs and exhibitions. A special demonstration unit continued to address safety on the farm.

RESEARCH AND DEVELOPMENT

Manitoba Hydro has a research and development program to enhance the design, construction and operation of the utility's power system and to keep abreast of technological developments that can impact the Corporation. Most of this research and development is carried out in conjunction with other organizations.

One of the major areas of research is the field of high voltage direct current technology. Manitoba Hydro is one of four sponsors of the Manitoba HVDC Research Centre. The HVDC Research Centre is continuing to research areas that contribute to Manitoba Hydro's leadership role in HVDC technology and to effectively market its abilities throughout the world.

Maintenance Supervisor Jim McNeill operates a grinder with the help of Smartool 3, a robotic assist device developed under the auspices of Manitoba Hydro's Research and Development program.

Another key area of involvement for research and development is with the Canadian Electrical Association (CEA). As a partner with the other electric utilities that are members of CEA, Manitoba Hydro is able to take advantage of large scale research activities.

The Corporation also collaborates with Manitoba universities in research by supporting graduate studies in work that could have a direct value to Manitoba Hydro. Projects investigated during the past year included: new techniques to determine the most effective use of water resources; the application of microprocessors to system protection equipment; and new computer analysis techniques for determining the strength of structures.

Several research and development projects are being carried out by engineers and scientists throughout the Corporation in conjunction with local engineering or manufacturing companies. These companies usually assume the responsibilities for commercializing and marketing any products that result. Some of the projects initiated by Manitoba Hydro staff during the year include: a power disturbance monitor to increase knowledge about the characteristics of the power network; a robotic assist device for turbine blade repair; and a computerized safe grounding training system.

Oil Containment Measures

The transformers used at Manitoba Hydro's generating stations and large transformer stations contain substantial quantities of light insulating oil.

During the past several years the Corporation has been taking steps to protect the environment from accidental leaks or spills of this oil. Where transformers are located on the tailrace decks of generating stations, concrete containment curbs have been built at a number of stations to control spills and prevent any seepage into the water. The Corporation will continue to monitor its facilities with a view to making ongoing improvements in this area.

On October 19, 1989, 900 litres of light lubricating oil leaked from a faulty lubricating oil cooler at the Selkirk Generating Station into Cooks Creek. Upon discovery, the generating unit was immediately shut down and station staff strung an absorbent oil boom across Cooks Creek to contain the spill. The oil was confined to a limited area and virtually all of it was recovered by skimming the water and through the use of absorbent materials. Although quick action by Hydro staff, the Canadian Coast Guard and Provincial Environment and Workplace Safety and Health Department prevented significant harm to the area, the Corporation has set out to review its operations and equipment with the goal of preventing such accidents in the future.

ENVIRONMENTAL MANAGEMENT

As part of the Bipole III environmental assessment process, extensive public consultations were carried out during the year to allow public involvement in the development of the environmental study plan. Here, Environmental Specialist Wayne Everett meets with community leaders in Garden Hill to review the Corporation's plans.

Electricity has long been considered to be a very clean energy source at its point of use and generating electricity from hydroelectric facilities is the cleanest means of producing large quantities of electricity. It has also been recognized, however, that the production of electricity in quantity involves altering the environment to some degree. Manitoba Hydro recognizes the requirement for environmentally acceptable energy development for present and future generations of Manitobans.

During the year, environmental assessments continued on the Conawapa generating site and a major transmission facility, Bipole III. The study plans for these projects were issued and extensive public consultations have been held. By the end of the year, some 60 meetings had been held with interested groups to obtain their views on the study plans.

Information on the effects of the projects will be gathered and evaluated and appropriate impact management programs and activities will be designed. Such programs have as their goal the reduction of the probability and seriousness of any adverse effects of development. Other activities consider means of providing socio-economic opportunities for those affected.

At the request of the Premier of Manitoba, the Corporation initiated a post-project evaluation of the Grand Rapids development during the year. The study, conducted by an interdisciplinary consultant team, examined the effects of the project on aboriginal communities in the area, including those at Easterville, Moose Lake, Cormorant and The Pas. The report of the consultants will be used to determine whether and to what extent Manitoba Hydro has outstanding responsibilities with respect to resource losses, general damages and mitigation measures. Discussions with the affected communities will take place in the coming year.

In addition to its major projects, the Corporation must also consider the impact of its ongoing and routine operations on the environment. For instance, Manitoba Hydro staff work closely with government agencies to ensure that the thermal generating stations operate within the applicable standards for air and water quality.

In the normal course of its business, Manitoba Hydro must use certain hazardous substances and materials. The Corporation ensures that the use, storage, transportation and disposal of such substances and materials are in accordance with current legislation, regulations and practices. Whenever possible, non-contaminating and non-hazardous products are used.

Managing PCBs

Manitoba Hydro is a leader in Canada in the handling and treatment of PCB-contaminated material. PCBs (polychlorinated biphenyls) are synthetic oil-like substances that are environmentally persistent and difficult to destroy. PCBs are fire resistant and very stable. These qualities led to their use as an insulating fluid in various types of electrical equipment. Many other pieces of equipment filled with non-PCB insulating oil inadvertently became contaminated with low levels of PCBs. Any fluid containing 50 parts per million or more is considered to be contaminated and a possible risk to the environment.

Since 1985, Manitoba Hydro has been operating special equipment which chemically destroys the PCB content in low-level contaminated insulating oil and leaves the oil clean and reusable. In the 1989-90 year, 1 471 686 litres of oil were treated by this equipment, bringing to more than five million litres the total volume of oil decontaminated to date. This amount is almost 60 per cent of the Corporation's estimated total of PCB-contaminated oil.

In addition to this decontamination process, the Corporation also maintains a specially designed building in Winnipeg to store PCB-contaminated solids and liquids with high PCB content un-

til suitable disposal methods have been decided upon for Manitoba. The building features metal construction with a curbed concrete floor to reduce the possibility of fire and to contain spills.

Mitigation

Manitoba Hydro continues to implement its policy of ensuring that all who are adversely affected by its projects are dealt with fairly and equitably through mitigation and compensation programs.

The Churchill River Diversion and Lake Winnipeg Regulation projects, undertaken in the 1970s, allowed Manitoba Hydro to significantly increase the capacity of the Burntwood and Nelson Rivers to produce electricity. These projects improve the operation of the Jenpeg, Kettle and Long Spruce Generating Stations which are already in place, as well as the Limestone Generating Station which is under construction.

While electricity consumers in Manitoba are continuing to benefit from these water diversion and regulation projects, the economies and way of life of several communities in the northern part of the province have been affected by the alteration of seasonal water levels and flows. To date, Manitoba Hydro has provided in excess of $87.6 million in compensation and remedial measures to ameliorate related losses or damages.

A significant part of the Corporation's mitigation activity (approximately $52.2 million) has involved five Indian Bands which, along with Canada, the Province of Manitoba, and Manitoba Hydro, are signatories to the Northern Flood Agreement (NFA). This 1977 Agreement allows the Corporation to operate the Churchill River Diversion and to regulate Lake Winnipeg while providing a formal mechanism by which the five bands can seek compensation for adverse effects. The Agreement ensures discussion on cause and extent of adverse effects and facilitates implementation of appropriate compensation. In the event of disagreement, parties can seek resolution through an arbitrator.

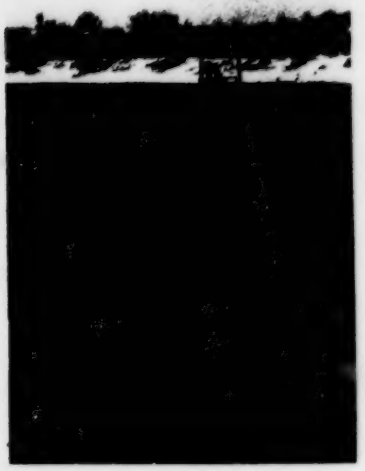
Since 1979, Manitoba Hydro has processed over 3 090 claims from individuals, with 2 870 settled to the claimants' satisfaction. Approximately 136 of the individual claims have been rejected, with 84 still under review.

The bands have also filed 152 claims with the arbitrator, of which 135 involve Manitoba Hydro. Seventy-seven of the major claims have been negotiated outside of arbitration and six have required review and final award by the arbitrator.

The remaining 52 claims are active.

In 1989-90, significant expenditures were directed towards resolution of arbitration claims for Nelson House recreation ($7.2 million), Cross Lake domestic fishing ($2.0 million) and South Indian Lake Community and Housing Associations ($2.0 million).

In December 1988, the four parties to the NFA each appointed a Senior Negotiator to undertake comprehensive global negotiations intended to reach settlement on all outstanding issues. The negotiations are continuing and are expected to be completed by the end of the 1990-91 fiscal year.



Safeguarding fish

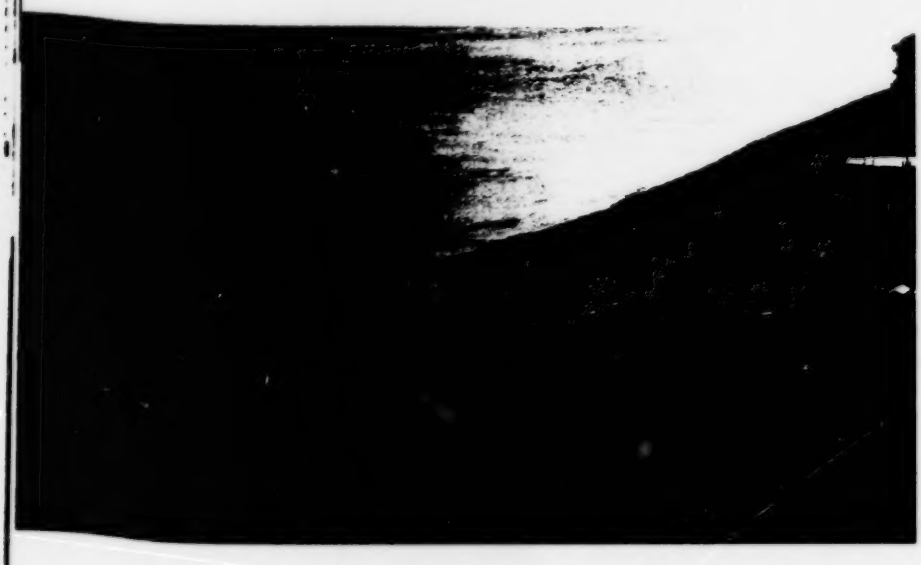
Manitoba Hydro's thermal generating station in Selkirk requires a supply of cooling water in order to operate. It obtains this supply from the Red River and discharges it into nearby Cooks Creek, a tributary of the Red. In the winter, fish in the Red River are attracted to the warm water discharged from the station and congregate in Cooks Creek. There they become acclimatized to the warmer water and may die if the station stops operating and the water cools quickly. Such a kill of fish occurred in the winter of 1987-88. The Department of Natural Resources Fisheries Branch staff and a citizens' group called Fish Futures have worked with Manitoba Hydro to develop an inexpensive but effective solution to protect fish in the area. For the past two years, a "fish fence" has been installed at the mouth of Cooks Creek to keep the fish from migrating into the creek when the station discharges warm water. Prior to spring break-up the wood and wire fence is removed to allow the fish to move into the creek. Over the past two winters, the fish fence has been very effective in preventing fish kill in the Cooks Creek area.

DEVELOPMENT INITIATIVES

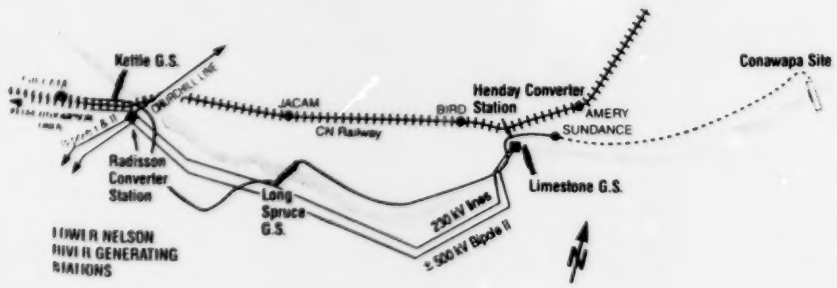
During the 1989-90 year, Manitoba Hydro introduced a four-point electricity supply plan that is intended to meet the electricity needs of Manitobans into the 21st century. The plan results from a thorough analysis of the available energy options and utilizes the most economical means of both increasing the supply of and controlling the demand for electricity.

The four points in the program are:

- The sale of approximately 1 000 megawatts of electricity to Ontario Hydro for 22 years, starting in the year 2000. This agreement was signed on December 7, 1989 by Premier Gary Filmon of Manitoba and Premier David Peterson of Ontario.
- Diversity exchange agreements with Northern States Power Company of Minneapolis and United Power Association of Elk River, Minnesota. These diversity exchanges, to begin in 1995 for a 20-year period, are for a total of 300 megawatts. That amount is available to serve Manitoba's peak winter load, while the same amount is made available to the U.S. utilities to meet their summer peak. The exchange agreements allow Manitoba Hydro to defer for a year the need for a new supply of electricity.
- A target 100 megawatt reduction in load forecast through demand management by 2001. Through a variety of measures, the Corporation intends to encourage residents, business and industry in Manitoba to reduce their consumption of electricity. This reduction in demand would defer by at least one year the requirement for a new source of generation.
- Rehabilitation work on the Corporation's thermal generating stations in Brandon and Selkirk. This work will ensure that the plants will reach their predicted retirement dates and beyond, thereby deferring the need for replacement generation.

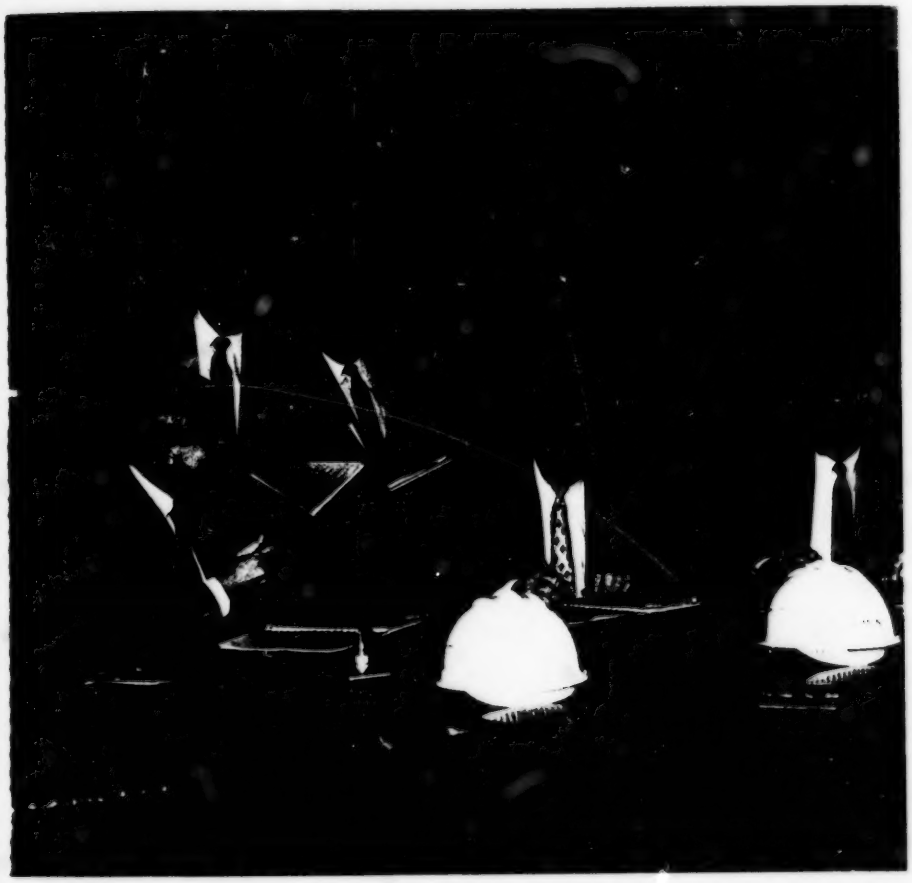


The Conawapa site on the Nelson River. During the year, a small cofferdam was built at the site to allow detailed study of the foundation conditions in the area. The information provided by this work will allow the most appropriate design approach for the construction of the Conawapa Generating Station.



The sale agreement with Ontario Hydro activated plans to build the Conawapa Generating Station and its associated transmission facility called Bipole III, estimated to cost a total of $5.7 billion.

Manitoba Hydro had been considering a number of options to meet the need for a new supply of electricity required for Manitoba by the year 2000. The magnitude of the sale, 1 000 megawatts, meant that the choice of a location for a new generating facility was narrowed to the Conawapa site, which will have a capacity of 1 300 megawatts. Conawapa is 31 kilometres downstream on



At a ceremony on December 7, 1989 at the Manitoba Legislature, Premier Gary Filmon, centre, and Premier David Peterson of Ontario, left, signed agreements for the sale of power to Ontario Hydro for 22 years beginning in the year 2000. Also signing the agreement was Chairman Brian Ransom, right, while Ron Kirby and Paul Thompson, Manitoba Hydro, behind, assisted.

the Nelson River from the Limestone Generating Station now under construction.

Manitoba Hydro is committed to a thorough public review of the economic and the environmental impacts resulting from this agreement. This process will include a review of the Corporation's long-term capital plans by the Public Utilities Board of Manitoba.

The sale to Ontario Hydro will bring projected revenues of $13 billion to Manitoba Hydro over the period from 2000 to 2022. The sale will result in consumers being better off in every year of the sale than they would be without the sale - that is, their electricity rates will be lower. Revenues from the sale will help finance construction of Conawapa and at the end of the sale period, 1 000 megawatts of electricity will be available for the use of Manitobans for the remaining life of the station - some 80 or more years.

In order to effect the sale, a new high voltage transmission line will be required from the Winnipeg area to Ontario. While the route of the line has yet to be determined, it is expected that the Ontario portion of the line will terminate near Sault Ste. Marie.

Both the Conawapa and Bipole III projects will require licensing under the Manitoba Environment Act. Manitoba Hydro had issued study plans for both projects before the announcement of the sale in order to protect the in-service date for the projects.

LIMESTONE MOVES CLOSER TO PRODUCING POWER

At Limestone, the site of Manitoba Hydro's newest hydroelectric generating station, construction activity during the year was aimed at the production of first power from the station in the fall of 1990. As a result of successful efforts at Limestone, the first generating unit may begin producing power somewhat earlier than the scheduled date of November 1990. The current schedule calls for an in-service date for all ten generating units of November 1992.

At the start of the construction season at Limestone, most of the major structures on the site had been completed, and efforts were focussed on earthworks and the installation of the turbines, generators and associated equipment inside the powerhouse.

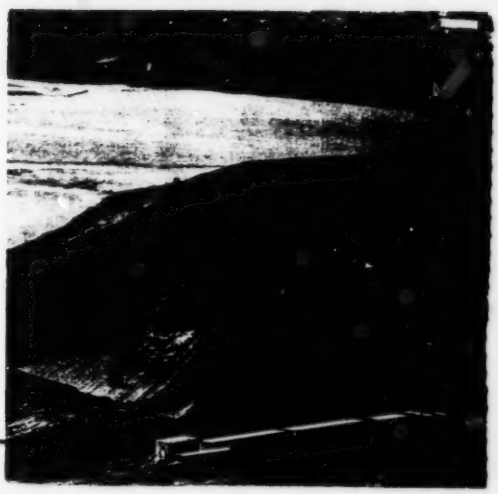
A significant test for the project came in June 1989 when the total flow of the Nelson River was diverted through the seven spillway passages. The spillway was designed to handle a capacity of 336 000 cubic feet per second—more than three times the peak flow of the Red River during the 1950 flood. The diversion was necessary to enable the construction of the south dam across the Nelson. By mid-November some 1 300 000 cubic metres of earthfill had been placed to complete that structure.

Inside the powerhouse, activity was underway on all ten generating units.

Intricate formwork was used to allow the pouring of concrete to complete the curved semi-spiral scroll case for each unit. By the end of the year, 630 700 cubic metres of concrete or 97 per cent of the total of 650 000 cubic metres required for the project had been put in place.

Each of the huge components of

Above: In June 1989, work began on the removal of the cofferdam in front of the powerhouse and spillway at Limestone. This allowed the Nelson River to flow through the spillway structure and permitted the construction of the south cofferdam, below.



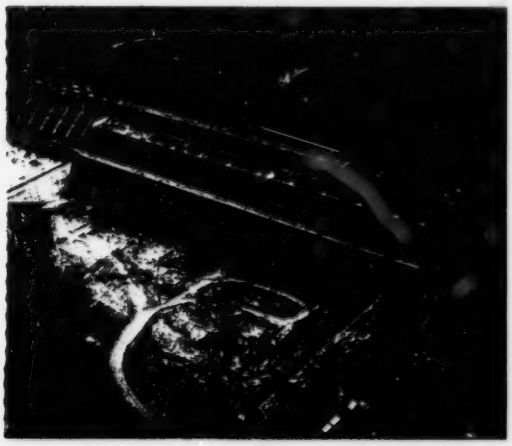
Right: Once the south cofferdam was completed, work got underway on the permanent south dam that completes the spanning of the Nelson River by the Limestone structure.

the turbines and generators — the stay rings, stator, turbine runner, shaft and rotor — were being placed with the precise accuracy necessary to ensure proper operation and long life. Installation of the mechanical and electrical systems in the station also continued during the year.

Peak employment at the project in 1989-90 reached 711. Some 400 people remained on site during the winter to continue work inside the enclosed powerhouse.

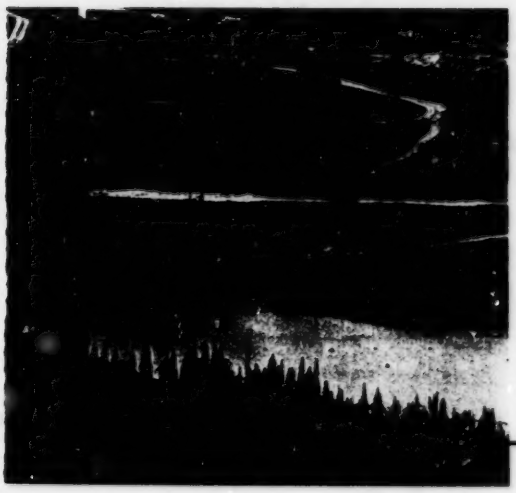
The Nelson-Burntwood Collective Agreement, which governs the labour relations aspects of the project, contains measures aimed at ensuring significant participation of natives and northerners in the project. During the year under review, the monthly participation rates for northerners ranged from 30 per cent to 38 per cent. Participation rates for northern natives ranged from 17 per cent to 22 per cent of the total workforce.

The $1.52 billion Limestone project will add 1 280 megawatts of electricity to the Manitoba system when completed. When the excitement of the project's construction period fades, it will become another fixture in the network of hydroelectric generating facilities in Manitoba, its turbines generating power for Manitobans for the next 100 years.



Left: Limestone late in the summer of 1989, with the Nelson River flowing though the spillway and work underway on the south cofferdam and inside the powerhouse.

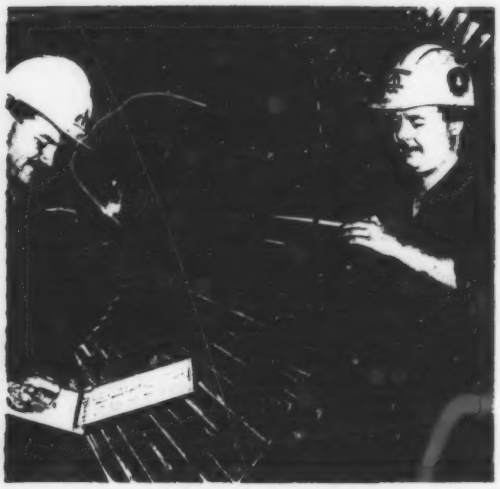
Below: Work continued on the ten massive generators and turbines being installed in the generator hall at Limestone.



Restoring the land

In building northern generating stations and other facilities, it has been necessary to clear the natural cover from areas in order to build temporary roads, to get access to sand and gravel and for camp and work areas. Restoring these disturbed areas has been a challenge for the Corporation given the difficult climatic conditions and soil materials in northern Manitoba. After some four years of test plot studies using grasses in different site conditions, Manitoba Hydro seeded and fertilized 50 acres of cleared land during the 1989-90 year in sites around its Long Spruce Generating Station and the Limestone Generating Station currently under construction. In addition, in 1988, the Corporation planted some 2 000 black spruce seedlings in cooperation with the Natural Resources Department, to determine the feasibility of more extensive reforestation programs. The Corporation takes very seriously its responsibilities to preserve the fragile environment of the north, particularly the need to rehabilitate areas necessarily disturbed by its construction activities.

SYSTEM DEVELOPMENT



Manitoba Hydro technician Scott Sylvester, left, and trainee Aaron Schell do an inspection on part of a turbine at the Selkirk Generating Station. During the year, life assessment and extension studies were carried out at both the Brandon and Selkirk thermal generating stations.

Transmission and Stations

Manitoba Hydro continues to upgrade and expand its transformer stations and transmission and distribution lines in order to meet increased customer demand and to improve reliability of service. During 1989-90 the Corporation completed construction of a new station at Star Lake, along with a 14 kilometre section of line. The station is being supplied from a 115 kilovolt transmission line to Ontario that is being replaced. Work continues on the remaining section of the line from the new station to Seven Sisters. The new facilities will meet the growing customer demand for electricity in the Whiteshell recreation area.

A 35 kilometre 138 kilovolt transmission line was completed and placed in service in November 1989 between the Kettle Generating Station and the Limestone Generating Station. This line provides a firm power supply to the Limestone Generating Station and the Henday Converter Station and to the communities of Sundance and Bird.

Under construction during the year was a 60 kilometre 230 kilovolt transmission line from the existing Ashern-Ridgeway line to a new terminal station being constructed near the community of Silver. The line and station are scheduled to be in service by the fall of 1990 to meet increased demand in the Interlake area.

Maintenance and Rehabilitation

The proper maintenance of generating and converter stations and dams and control structures enables Manitoba Hydro to continue the efficient operation of these resources and ensure that the expected useful lives of these facilities are reached or exceeded. The Corporation has in place long-term programs to ensure the appropriate maintenance of its facilities.

Rehabilitation work on the electrical and mechanical systems at the Great Falls, Pine Falls and Seven

Manitoba Hydro Generating Stations

Great Falls *Seven Sisters* *Pine Falls* *McArthur* *Kelsey* *Grand Rapids*

Sisters Generating Stations continued during the year. Dyke repairs at McArthur and Great Falls Generating Stations were completed in 1989-90.

At the Grand Rapids Generating Station, extensive work on exterior concrete structures was undertaken during the year, in addition to various mechanical work, including modifications to the turbines and generators.

During the year, work was completed on the rehabilitation of the Manasan control structure, located eight kilometres southwest of Thompson on the Burntwood River. The structure facilitates the formation of an ice cover upstream on the river, preventing the build[illegible]f ice and avoiding water risi[illegible]ownstream that could cause floodi[illegible]g at Thompson. The rehabilitation work, which cost $3.2 million, added a bypass channel to the structure to increase the maximum discharge capacity in the event of high water flows.

Thermal Generation

During 1989-90 the results of life assessment and extension studies of Manitoba Hydro's thermal generating stations at Selkirk and Brandon were made available.

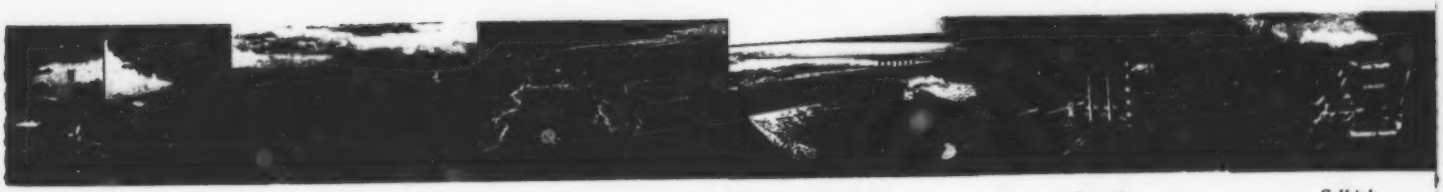
A decision was made to proceed with rehabilitation work at both stations at a cost of approximately $100 million. The work will ensure that units one to four at Brandon will be available until the year 2000, unit five at Brandon until the year 2006 and units one and two at Selkirk until the year 2005.

Along with refurbishment of boilers, turbines and generators, the coal handling facilities at the plants will be modernized. Equipment will be added to meet more stringent environmental requirements, including electrostatic precipitators to reduce the emissions. A cooling tower will be added at Brandon to reduce the temperature and volume of the water discharged into the Assiniboine River. The work should be completed by 1993-94.

Support for fish hatchery

In the 1989-90 fiscal year, Manitoba Hydro contributed $60 000 towards the operation of the Grand Rapids fish hatchery, which has been operated by the Fisheries Branch of the Provincial Government since 1962.

The financial contribution was made to assist in the continued funding of the hatchery while the future involvement in the project by the Corporation is assessed. Manitoba Hydro is considering the stocking of fish as part of its mitigation programs aimed at the rehabilitation of the northern waterways affected by its projects. The hatchery in 1989-90 focussed on the production of lake trout, splake, rainbow trout and walleye.



Laurie River 1 & 2 *Kettle* *Jenpeg* *Long Spruce* *Brandon* *Selkirk*

ELECTRICAL PRODUCTION

The drought that affected much of western Canada for the previous two years continued in 1989-90 although conditions did improve during the year. The energy generated by the 13 hydraulic generating stations in the integrated Manitoba system was 18.7 billion kilowatt hours, up 22.6 per cent from the 15.2 billion kilowatt hours generated in the 1988-89 year. The record annual hydraulic production in Manitoba was achieved three years ago when 24.0 billion kilowatt hours were generated.

The total amount of energy generated and purchased during 1989-90 to meet the requirements of the Manitoba integrated system and for power sold outside the province was 20.6 billion kilowatt hours, an increase of 11.8 per cent from the 18.4 billion kilowatt hours required in 1988-89.

Generation from hydraulic sources amounted to 90.6 per cent of total system supply compared to 82.7 per cent in 1988-89. The non-hydraulic portion of total supply was 2.1 per cent thermal and 7.3 per cent extraprovincial purchases.

The stations on the Nelson River produced 65.8 per cent of system supply compared to 61.6 per cent in 1988-89. This increase was a result of modest improvement in the overall water supplies in the Nelson River watershed.

Generation from the Winnipeg River stations totalled 19.9 per cent of system supply, an increase from the 15.9 per cent of system supply generated in 1988-89. Reservoir levels at the beginning of the year and above normal precipitation until mid-July were factors leading to improved generation although these were moderated by lack of summer and fall precipitation.

On the Saskatchewan River, generation at Grand Rapids was up 4.2 per cent from the previous year. River flows for the year were the third lowest on record. Flows in 1988-89 were the second lowest making the average flow of the last two years the lowest on record since 1912. The flows on the Saskatchewan River have not reached the long-term average for the river once in the past 15 years.

Thermal generation required for energy supply and area voltage support during the year totalled 432.3 million kilowatt hours, down 50.0 per cent from the 864.1 million kilowatt hours generated last year. Brandon Generating Station produced 91.4 per cent of the total, while Selkirk Generating Station produced 8.6 per cent.

Imports of electricity during the year were down 35.3 per cent from the previous year, to 1.5 billion kilowatt hours from 2.3 billion kilowatt hours. Purchases were 92.9 per cent from the U.S. with the remainder from Saskatchewan.

Approximately 12 per cent of the energy purchased was for Manitoba consumption while the rest was resold. The cost of purchases was $23.8 million compared to $39.9 million in 1988-89.

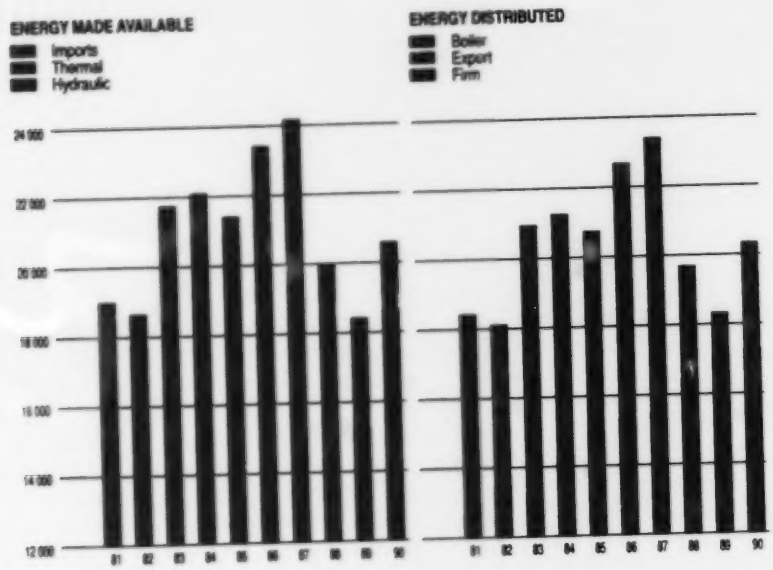
Sales of electricity outside the province amounted to 3.1 billion kilowatt hours, more than double the 1.2 billion kilowatt hours last year. Revenue from sales of exports totalled $60.1 million compared to $31.1 million in 1988-89.

Sales to Ontario accounted for 58.7 per cent of exports, the U.S. for 40.6 per cent and Saskatchewan for 0.7 per cent.

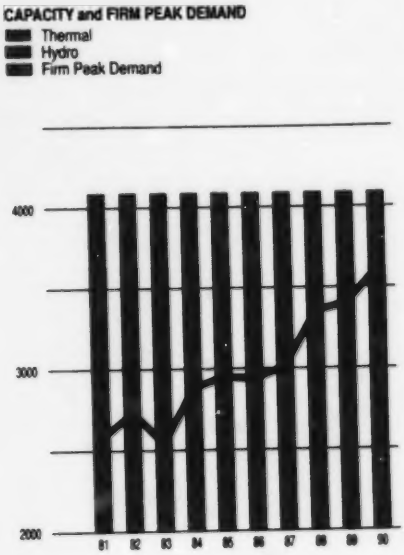
A total of 17.3 billion kilowatt hours of electricity were required to meet the needs of Manitoba Hydro customers during the year, an increase of 1.1 per cent from the 17.1 billion kilowatt hours required in 1988-89. The peak demand for electricity on the Manitoba system was recorded on December 20, 1989 when an all-time high load of 3 631 000 kilowatts was reached. This was an increase of 6.6 per cent from last year's peak of 3 407 000 kilowatts.

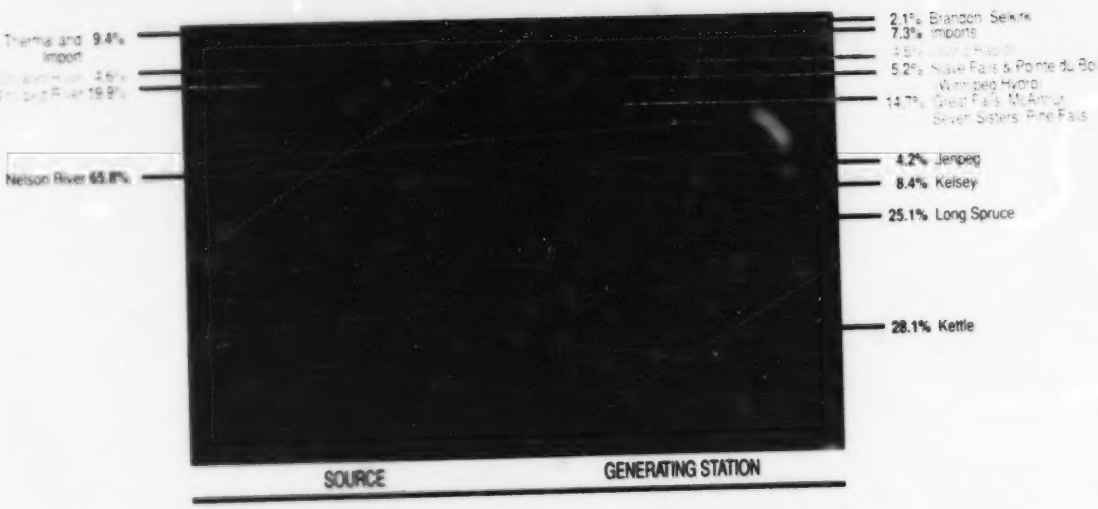
Manitoba Hydro continues to supply diesel-generated electricity to 13 communities not connected to the central supply grid. In 1989-90 the supply totalled 20.9 million kilowatt hours, up 8.2 per cent from 19.3 million kilowatt hours provided in 1988-89.

INTEGRATED SYSTEM 10-YEAR COMPARISON GENERATION, PURCHASES AND SALES
in Millions of Kilowatt Hours for Fiscal Year Ended March 31.



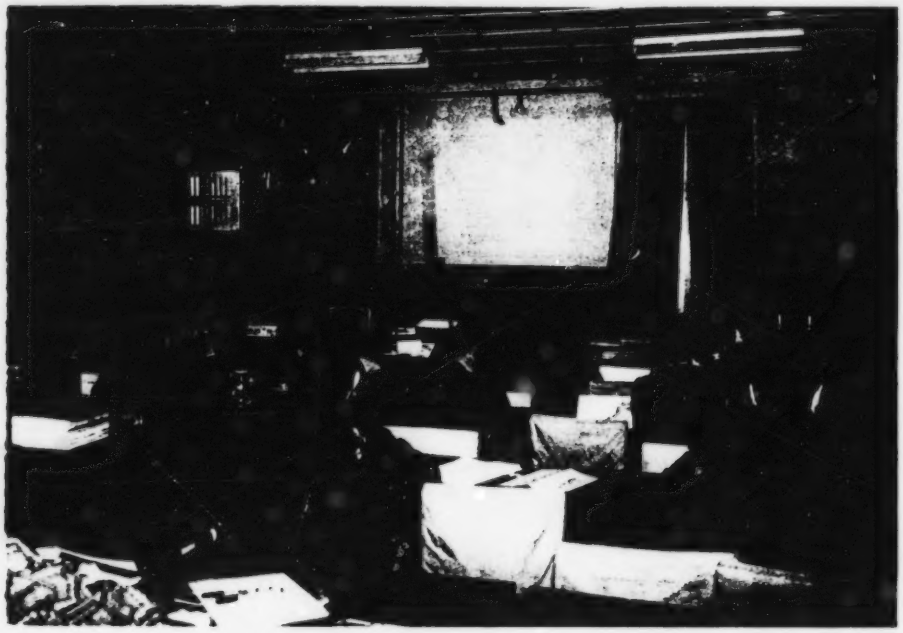
INTEGRATED SYSTEM 10-YEAR COMPARISON
CAPACITY AND FIRM PEAK DEMAND
in Thousands of Kilowatts for Fiscal Year Ended March 31.





SOURCE OF ELECTRICAL ENERGY GENERATED AND PURCHASED for Fiscal Year Ended March 31.

UTILITY CONSULTING SERVICES



Manitoba Hydro employee Dennis Kakoske provides instruction in remote terminal units to a class in Beijing, China in November 1989. Dennis and another Hydro employee, Walter Andrejowich, were in China under the auspices of the CIDA-funded China Technical Assistance Program.

Manitoba Hydro makes available consulting and training services to customers around the world in conjunction with other Canadian utilities, engineering consultants and/or electrical industry suppliers. The technical and management skills of Manitoba Hydro employees are in demand, particularly in developing countries that need to expand and improve their electric power systems.

Projects undertaken are, in almost all cases, funded by government supported agencies such as the Canadian International Development Agency (CIDA) or the World Bank. Services are offered on the basis of recovery of direct costs plus a margin for overhead and profit. Total revenue for the year exceeded direct costs by $331 000. The experience gained by Manitoba Hydro employees involved in this work is an added benefit to the Corporation and a source of satisfaction and growth for employees.

During the 1989-90 fiscal year, six employees were stationed overseas and a number of other staff members were involved for periods of a few hours to a few months. The cumulative involvement of staff totalled roughly 10.5 person years.

In addition to posting employees overseas, Manitoba Hydro also hosts people from other countries who wish to be trained in Manitoba.

The employees posted overseas in 1989-90 comprised two in Egypt and four in Zimbabwe. In Egypt, an expert in telecontrol systems and a line trades expert trained instructors for a transmission training school that the Egyptian Electricity Authority has established in Cairo. This training project is funded by CIDA and is being done in conjunction with Ontario Hydro.

In Zimbabwe, four Manitoba Hydro employees are providing training to senior personnel of the Zimbabwe Electricity Supply Authority (ZESA). This project is also funded by CIDA. This project also involved three senior planning executives from ZESA receiving training in Winnipeg and a short-term visit by a specialist in live-line maintenance to assess needs in the field.

Other brief overseas assignments involved a high voltage direct current engineer assisting Transpower in New Zealand with an equipment design review, and staff conducting a seminar in Beijing, China on remote control of electricity.

During the year, Manitoba Hydro hosted trainees from India and China. Studies for electrical systems in China were worked on in Canada in conjunction with Teshmont Consultants Inc., Monenco Consultants Ltd. and Ontario Hydro. This work is funded by the World Bank.

FINANCIAL SECTION

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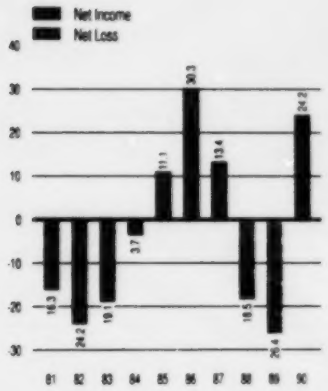
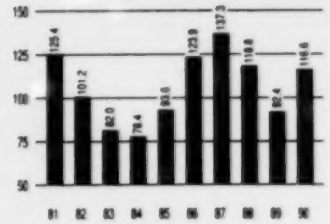
FINANCIAL REVIEW



Net Income (Loss)
(in millions of dollars)

Operations for the year ended March 31, 1990 resulted in a net income of $24.2 million compared to a net loss of $26.4 million in the previous fiscal year. This follows two consecutive years where expenses exceeded revenues. The improvement of $50.6 million in operations is primarily attributable to the financial impact of improved water flow conditions during the first part of the fiscal year and to the average general consumers rate increase of 5.0% implemented April 1, 1989.

Although Corporate financial reserves increased from $92.4 million in 1988-89 to $116.6 million in 1989-90, they remain significantly lower than the current targeted minimum reserve level of approximately $210 million. The Corporation remains committed to building reserves to adequate levels in order to prevent large rate increases caused by periodic droughts and unexpected contingencies, and to avoid large rate fluctuations when major new facilities are added to the system. Manitoba Hydro intends to achieve target reserve levels through gradual rate adjustments while

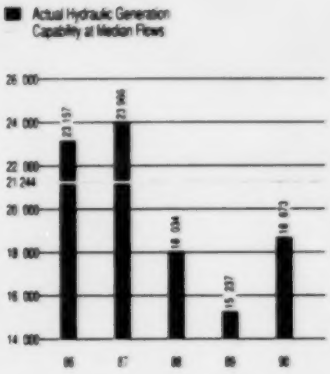


Reserve Levels
(in millions of dollars)

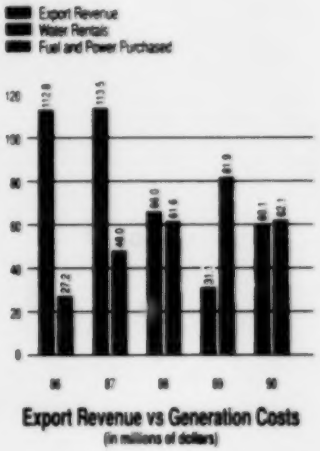
remaining sensitive to the financial impact on its customers.

The drought conditions experienced during the two previous fiscal years were partially alleviated following the spring run-off and the spring rains in 1989-90, however water levels continued to remain below normal in most of the major drainage basins throughout the balance of the 1989-90 fiscal year. As a result of the improvement in water conditions, total generation from the integrated system increased from 16.1 billion kilowatt hours to 19.1 billion kilowatt hours. Hydraulic generation increased by 22.6% from 15.2 billion kilowatt hours in 1988-89 to 18.7 billion kilowatt hours in 1989-90. Despite the increase, hydraulic generation was approximately 2.5 billion kilowatt hours or 12.0% less than the amount expected during years of normal water flows. The additional hydraulic generation in 1989-90 increased the amount of surplus power available for export and reduced thermal generation and energy purchase costs.

Revenues increased by $54.6 million or 9.0% to $664.1 million. The increase reflects the effects of higher extraprovincial sales, the rate increase implemented April 1, 1989 and marginally higher consumption of electricity by Manitoba Hydro general



Hydraulic Generation
Actual vs Median Flow Capability
(in millions of kWh)

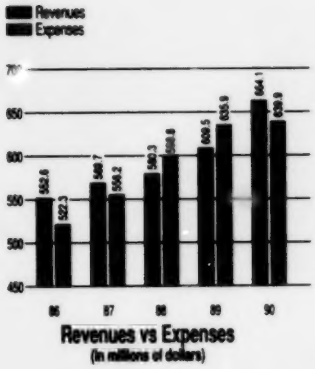


Export Revenue vs Generation Costs
(in millions of dollars)

consumers.

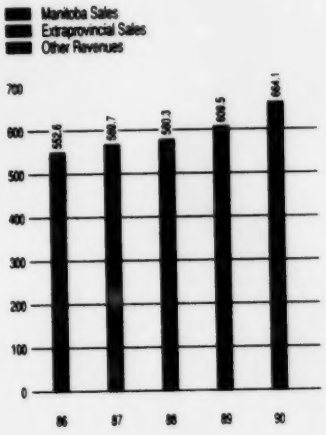
Expenses increased by $4.0 million or 0.6% to $639.9 million. Increases in operating and administrative costs, depreciation charges and water rentals were partially offset by decreased fuel and power purchase costs related to the improvement in water levels.

REVENUES



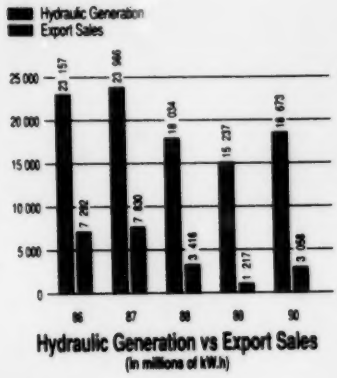
Sale of Power — Manitoba

Electricity sold to Manitoba Hydro general consumers increased from 12.7 billion kilowatt hours to 12.9 billion kilowatt hours in 1989-90. Although weather conditions were comparable to the previous fiscal year, the increase in sales was limited to 1.6% with the largest growth occurring in the general service small class. The amount of electricity supplied to Winnipeg Hydro decreased from 1.7 billion kilowatt hours in 1988-89 to 1.5 billion kilowatt hours in 1989-90 due to the increased hydraulic generation from its system. General consumers revenue increased by 6.2% to $549.4 million reflecting the growth in provincial consumption and the average 5.0% general rate increase implemented April 1, 1989. This, together with revenue of $47.5 million from Winnipeg Hydro under the terms of the cost sharing agreement, resulted in total revenue from Manitoba customers of $596.9 million, which represents an increase of 4.6% over 1988-89.



Sale of Power — Extraprovincial

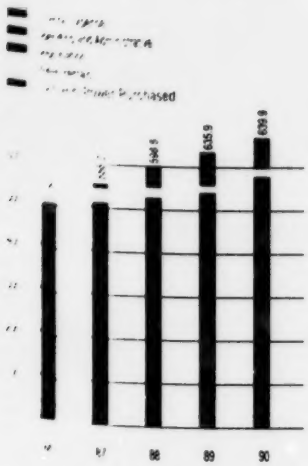
The improvement in hydraulic generation over the previous year resulted in additional electricity, surplus to the requirements of Manitoba customers, being available for export. Extraprovincial sales increased by 158.3% from 1.2 billion kilowatt hours to 3.1 billion kilowatt hours. Extraprovincial revenue totalled $60.1 million compared to $31.1 million in the 1988-89 fiscal year. The average selling price decreased from 2.56 cents per kilowatt hour in 1988-89 to 1.97 cents per kilowatt hour in 1989-90 reflecting the impact on unit rates of the higher level of energy available for export to U.S. markets.



EXPENSES

Finance Expense

Finance expense increased by $0.2 million to $241.9 million. The favourable impact of increased amounts of internally generated funds, the improvement in the value of the Canadian dollar in relation to the U.S. dollar on U.S. interest payments and cost savings realized due to the positive interest rate spread on short-term investments over long-term financing resulted in a decrease of $4.8 million in finance expense. The amortization of foreign exchange which resulted in a loss in 1989-90 compared to a gain in 1988-89 more than offset the decrease in finance expense. The $5.0 million offset reflects the introduction of the exposure management program which eliminated the amortization of foreign exchange on U.S. denominated debt and the amendment to the Energy Rate Stabilization Act effective April 1, 1989 which transferred responsibility for foreign exchange on non-U.S. denominated debt to the Corporation.



Distribution of Expenses
(In millions of dollars)

Operating and Administrative

Operating and administrative costs increased by $18.6 million to $248.3 million due in part to contractual increases of $3.3 million in transmission line lease payments and an increase of $2.7 million in pension cost. Additional costs of $1.1 million were incurred due to forest fires in Manitoba during the summer of 1989 and for restoring customer service and repairing plant following major equipment failures and storm damage. The balance reflects an $11.5 million increase in costs associated with the operation, maintenance and administration of the utility.

Depreciation

Depreciation charges increased $5.0 million to $87.6 million in 1989-90. Additions to generation, distribution, substation and transmission plant accounted for $3.6 million of the increase with the balance due to the amortization of preliminary planning study costs, other small plant additions and the part-year addition of the Letellier — St. Leon transmission facility.

Water Rentals

The 21.8% increase in Manitoba Hydro's hydraulic generation together with an increase in water rental rates from $8.96 per horsepower-year to $9.90 per horsepower-year effective September 1, 1989 resulted in water rental costs of $28.9 million. This is an increase of $6.0 million or 26.2% over the previous fiscal year.

Fuel and Power Purchased

Fuel and power purchased costs decreased from $59.0 million in 1988-89 to $33.2 million in 1989-90. The improvement of $25.8 million or 43.8% over 1988-89 is due to the increase in hydraulic generation which has enabled the Corporation to displace thermal generation and reduce its power purchases from utilities outside the province. In addition, the average price of power purchased decreased from 1.71 cents per kilowatt hour in 1988-89 to 1.59 cents per kilowatt hour in 1989-90.

CAPITAL EXPENDITURES AND FINANCING

Capital Expenditures

Investments in fixed assets increased by $426.9 million to $3 882.9 million in 1989-90. Capital expenditures of $227.5 million were incurred on the Limestone Generating Station, $47.4 million on Limestone-related system requirements and $15.7 million on other major transmission facilities. The utility also spent $17.4 million for preliminary planning studies associated with the next source of generation and related transmission facilities. The remaining capital expenditures were for other additions, modifications and service extensions throughout the province.

Limestone Generating Station

Construction of the Limestone Generating Station proceeded extremely well during the 1989-90 fiscal year. The generating station will provide a net capacity addition of 1 280 megawatts with first power currently scheduled for November 1990. All major contracts have been awarded and the latest approved estimate of total cost is $1 523.8 million, with $1 070.4 million having been spent to March 31, 1990.

Financing

For the purpose of financing capital construction the Corporation utilizes cash generated from operations and external financing. Cash provided by operating activities was $152.2 million (1988-89 $74.3 million) and external financing net of debt maturities totalled $204.1 million (1988-89 $304.8 million).

Manitoba Hydro Savings Bonds

During the 1989-90 fiscal year, the first issue of Manitoba Hydro Savings Bonds was introduced. HydroBonds were sold exclusively to Manitobans with total sales amounting to $312.4 million. This issue, which matures June 15, 1992, has a guaranteed annual interest rate of 11.25% (10.71% monthly) for the first year and a minimum guaranteed annual interest rate of 10.00% (9.57% monthly) for the remaining two years. The bonds are redeemable at par plus interest on June 15 and December 15 of each year prior to maturity. Proceeds from the sale were used to repay maturing debt and to finance capital construction including the Limestone Generating Station.

A second series of Manitoba Hydro Savings Bonds is being offered for sale exclusively to Manitobans commencing May 18, 1990.

Exposure Management Program

Effective April 1, 1989, the Corporation adopted an exposure management program to actively manage and limit the potential adverse financial impact of U.S. dollar fluctuations on the Corporation. The program specifically addresses U.S. dollar exposure by entering into contracts, agreements and arrangements which will effectively offset the net outflows of U.S. dollar debt payments with net inflows of revenue to be received in U.S. dollars.

PUBLIC UTILITIES BOARD

Rate Review

In November 1989, the Corporation applied to the Public Utilities Board for approval of an average general consumers rate increase of 4.5% effective April 1, 1990. The application would have provided additional revenue of approximately $25.7 million and recognized Manitoba Hydro's need to recover its costs and to improve its financial reserves that had been depleted due to the drought.

On March 26, 1990, the Public Utilities Board, in its order number 43/90, directed that the general consumers rate increase to be implemented April 1, 1990 be reduced by 0.5% to an average of 4.0%; representing an approved increase in additional revenue of approximately $22.9 million.

Major Capital Projects Hearing

Manitoba Hydro has requested a public review of its proposals in respect of Major Capital Projects required for generation and transmission. On April 23, 1990, the Corporation filed a submission of its proposals for review by the Public Utilities Board. The review, which is scheduled to commence on August 20, 1990 in Winnipeg, will provide the opportunity for public participation and discussion prior to final commitments being made by Manitoba Hydro.

FINANCIAL OBJECTIVES

In September 1989, the Corporation adopted specific financial targets together with an implementation timetable.

The short-term objective is to achieve minimum target reserve levels within the next five years. The target is calculated as the amount required to withstand the financial effects of two years of drought equivalent to the worst on record, plus an amount equal to the maximum individual liability loss the Corporation could incur under its self-insurance program. The long-term objective is to attain and maintain an 85:15 debt/equity ratio within the 10 year period following the achievement of the minimum target reserve level. In moving towards the debt/equity ratio, the Corporation will maintain a gross interest coverage of 1.15 to 1.25, except in the interests of maintaining rate stability, interest coverage may not be achieved prior to and during periods in which the cost of new facilities is being absorbed into the rate base.

The achievement of financial targets will enhance the financial viability of the Corporation, contribute to rate stability and predictability, and protect the Corporation and its customers from a variety of risks.

MANAGEMENT REPORT

The accompanying financial statements are the responsibility of management and have been prepared in accordance with generally accepted accounting principles as established in Canada. These principles have been applied on a basis consistent with that of the preceding year. In management's opinion the financial statements have been properly prepared within reasonable limits of materiality, incorporating management's best judgement regarding all necessary estimates and all other data available up to June 1, 1990. The financial information presented elsewhere in the Annual Report is consistent with that in the financial statements.

Management maintains internal controls to provide reasonable assurance of the reliability and accuracy of the financial information and that the assets of the Corporation are properly safeguarded. An internal audit function independently evaluates the effectiveness of these internal controls on an ongoing basis and reports its findings to management and to the Audit Committee of the Board.

The responsibility of the external auditors, Peat Marwick Thorne, is to express an independent, professional opinion on whether the financial statements are fairly presented in accordance with generally accepted accounting principles. The Auditors' Report outlines the scope of their examination and their opinion.

The Audit Committee of the Board meets with representatives of the external auditors, the internal auditors and management to satisfy itself that each group has properly discharged its respective responsibility and to review the financial statements before recommending approval by the Board. The Board has reviewed the Annual Report in advance of its release and has approved its content and authorized its publication.

On behalf of Management:

R. B. Brennan, C.A. President and Chief Executive Officer

J. B. Gessner, C.M.A. Corporate Controller

AUDITORS' REPORT

To The Manitoba Hydro-Electric Board

We have examined the balance sheet of The Manitoba Hydro-Electric Board as at March 31, 1990 and the statements of operations, reserves and changes in financial position for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

In our opinion, these financial statements present fairly the financial position of the Corporation as at March 31, 1990 and the results of its operations and the changes in its financial position for the year then ended in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Peat Marwick Thorne

CHARTERED ACCOUNTANTS
Winnipeg, Canada
June 1, 1990

STATEMENT OF OPERATIONS

FOR THE YEAR ENDED MARCH 31, 1990 (with 1989 figures for comparison)

	1990	1989
	(thousands of dollars)	
REVENUES		
Sale of power		
Manitoba	$596 915	$570 862
Extraprovincial	60 089	31 142
Other revenue	7 084	7 497
	664 088	609 501
EXPENSES		
Operating and administrative	248 312	229 691
Depreciation—plant	87 572	82 620
Water rentals	28 855	22 867
Fuel and power purchased	33 209	59 049
	397 948	394 227
Net income before finance expense	266 140	215 274
FINANCE EXPENSE (Note 2)	241 943	241 710
NET INCOME (LOSS)	$ 24 197	$ (26 436)

The accompanying notes are an integral part of the financial statements.

BALANCE SHEET

AS AT MARCH 31, 1990 (with 1989 figures for comparison)

ASSETS	1990	1989
	(thousands of dollars)	
FIXED ASSETS (Note 3)		
In service	$3 748 338	$3 619 824
Less: Accumulated depreciation	1 071 602	996 568
	2 676 736	2 623 256
Construction in progress	1 206 202	918 077
	3 882 938	3 541 333
CURRENT ASSETS		
Temporary investments	204 000	311 000
Accounts receivable	77 979	65 126
Accrued revenue and interest receivable	33 197	41 709
Materials and supplies, at average cost	39 418	35 849
	354 594	453 684
OTHER ASSETS		
Deferred pension expense (Note 1c)	170 416	176 964
Deferred expenses and advances (Note 4)	286 591	213 721
	457 007	390 685
	$4 694 539	$4 385 702

Approved on behalf of the Board:

Chairman

Vice-Chairman

LIABILITIES AND RESERVES	1990	1989
	(thousands of dollars)	
LONG-TERM DEBT (Note 5)	$3 556 626	$3 341 141
CURRENT LIABILITIES		
Bank balances	130 177	8 084
Accounts payable and accrued liabilities	103 883	85 880
Notes payable, due within one year	—	109 287
Accrued interest	100 070	96 951
Current portion of long-term debt (Note 5)	331 811	314 298
	665 941	614 500
DEFERRED LIABILITIES	26 543	22 194
PENSION OBLIGATION (Note 1c)	218 706	200 326
DEFERRED CREDITS (Note 6)	110 148	115 163
RESERVES (Note 8)	116 575	92 378
	$4 694 539	$4 385 702

The accompanying notes are an integral part of the financial statements.

STATEMENT OF RESERVES

FOR THE YEAR ENDED MARCH 31, 1990 (with 1989 figures for comparison)

			1990	1989
			(thousands of dollars)	
	Contingency and General	Rate Stabilization	Total	Total
BALANCE—BEGINNING OF YEAR	$137 277	$(44 899)	$ 92 378	$118 814
Net Income (Loss) transferred from operations	—	24 197	24 197	(26 436)
BALANCE—END OF YEAR	$137 277	$(20 702)	$116 575	$ 92 378

The accompanying notes are an integral part of the financial statements.

STATEMENT OF CHANGES IN FINANCIAL POSITION

FOR THE YEAR ENDED MARCH 31, 1990 (with 1989 figures for comparison)

	1990	1989
	(thousands of dollars)	
OPERATING ACTIVITIES		
Cash from operations		
Net income (loss)	$24 197	$(26 436)
Depreciation—plant	87 572	82 620
Amortization of debt discount and expense	8 771	7 097
Amortization of foreign exchange	516	(4 441)
Realized foreign exchange gain	(643)	—
Pension expense	24 928	23 362
Other	(3 474)	(2 489)
Non-cash working capital change	10 298	(5 445)
Cash provided by operating activities	152 165	74 268
FINANCING ACTIVITIES		
Proceeds from long-term debt	486 529	484 140
Retirement of long-term debt	(282 419)	(179 311)
Contributions and advances in aid of construction	17 284	31 303
(Decrease) increase in notes payable	(109 287)	109 287
Sinking fund payment	(54 313)	(50 350)
Other	3 217	1 369
Cash provided by financing activities	61 011	396 438
INVESTING ACTIVITIES		
Additions to fixed assets	(426 922)	(380 075)
Other assets	(15 347)	(12 300)
Cash used in investing activities	(442 269)	(392 375)
(DECREASE) INCREASE IN CASH	(229 093)	78 331
CASH AT BEGINNING OF YEAR	302 916	224 585
CASH AT END OF YEAR	$73 823	$302 916

The components of cash are bank balances and temporary investments.

The accompanying notes are an integral part of the financial statements.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED MARCH 31, 1990

NOTE 1 — SIGNIFICANT ACCOUNTING POLICIES

The financial statements have been prepared in accordance with generally accepted accounting principles as established in Canada.

a) Fixed Assets

Fixed assets are stated at cost which consists of contracted services, direct labour, material and expense, a proportionate share of overhead costs and interest applied at the effective rates incurred in financing construction. Finance expense is allocated to construction until a facility becomes operational or a decision is made to abandon, cancel or indefinitely defer construction. The cost of plant removed plus removal costs less salvage value is charged to accumulated depreciation.

Main facilities of major projects under construction become operational on a progressive basis. As such facilities become operational, related construction costs and a pro rata share of related common properties are transferred to plant in service. Once the transfer to plant in service is made, finance expense allocated to construction ceases and depreciation and finance expense charged to operations commences.

Depreciation is provided on a straight-line remaining life basis. The major components of generating stations are depreciated over the lesser of the remaining life of the major component or the remaining life of the associated generating station.

The range of the estimated service lives of components within each major asset category is as follows:

Hydroelectric generation	40-100 years
Thermal-electric generation	35-40 years
Transmission lines and stations	20-80 years
Distribution lines	10-60 years

b) Foreign Exchange:

Long-Term Debt

The translation of foreign long-term debt and the extent to which Manitoba Hydro is responsible for the resulting translation gains or losses has been established by the Energy Rate Stabilization Act. The Act, which came into force April 1, 1979 and which was amended as of April 1, 1987 and repealed as of April 1, 1989, sets out the Corporation's obligations on foreign long-term debt as follows:

i) United States Debt

The amendment to and repeal of the Energy Rate Stabilization Act transferred the foreign exchange risk associated with United States debt and other foreign debt converted to United States debt from the Province of Manitoba to Manitoba Hydro and accordingly the Corporation assumed responsibility for the translation gains or losses associated with this debt. The Province of Manitoba retained the obligation to pay up to the amounts provided in the Province's accounts to March 31, 1989 in respect of this debt. The Province of Manitoba and Manitoba Hydro have agreed to fix the amounts at $183.3 million. These amounts are recorded as deferred expenses on the balance sheet and will be received at the maturity dates of the respective debt issues.

Effective April 1, 1989, the impact of foreign exchange fluctuations associated with United States debt has been essentially eliminated through the implementation of an exposure management program. Under this program, United States denominated debt is offset against contracted future United States revenue. Accordingly, United States debt transacted prior to April 1, 1989 is translated at the book value in effect at April 1, 1989 after taking into account, where applicable, the Province's obligation for foreign exchange gains or losses and the amortization of unrealized foreign exchange gains or losses recorded by the Corporation to March 31, 1989. United States debt transacted after April 1, 1989 is translated at the rate of exchange in effect at the date of issue.

ii) Foreign Debt Other Than United States Debt

Effective April 1, 1989 the foreign exchange risk associated with foreign debt other than United States debt was transferred by the Province of Manitoba to Manitoba Hydro and accordingly the Corporation assumed responsibility for the translation gains or losses associated with this debt. The Province of Manitoba retains the obligation to pay up to the amount provided in the Province's accounts to March 31, 1989 in respect of this debt. The Province's obligation at March 31, 1990 based upon rates of exchange in effect on that date amounted to $2.3 million, this being the Province's maximum obligation. These amounts are recorded as deferred expenses on the balance sheet and will be received at the maturity dates of the respective debt issue dependent upon the exchange rate transacted to repay the debt.

Foreign long-term debt other than United States debt is translated into Canadian currency at rates of exchange prevailing at the date of the balance sheet, or in the case of debt fixed by foreign exchange contracts, at the contracted rate. The unrealized foreign exchange gains or losses net of the Province's obligation amount to $419 thousand, and are amortized on a straight-line basis over the remaining life of the related debt and together with realized exchange gains or losses are credited or charged to operations.

Current Assets and Current Liabilities

Current monetary assets and liabilities denominated in foreign currencies, with the exception of the current portion of long-term debt, are translated into Canadian currency at rates of exchange prevailing at the date of the balance sheet. The unrealized exchange gains or losses together with realised exchange gains or losses are credited or charged to operations. The current portion of long-term debt is translated in the same manner as long-term debt.

Sinking Fund Investments

Sinking fund investments denominated in foreign currencies are translated into Canadian currency at the rates of exchange prevailing at the date of the balance sheet, except where the investments have been hedged by the Minister of Finance of the Province of Manitoba, in which case the hedged rate confirmed by the Province is used in the translation. The unrealized exchange gains or losses are amortized on a straight-line basis over the remaining life of the investment and together with realized exchange gains or losses are credited or charged to operations.

United States Contracted Revenue

Under the exposure management program, future contracted United States revenues have been designated as an offset against United States debt. These revenues will be translated at the book value of the associated United States debt.

Other Transactions

Expense and revenue transactions made in foreign currencies are translated into Canadian currency at the rates of exchange prevailing at the date of the transaction, except transactions covered by monetary contracts which are translated into Canadian dollars at the rates of exchange established by the contracts.

e) **Pensions**

Manitoba Hydro provides pension benefits to employees through the Manitoba Civil Service Superannuation Fund, a defined benefit plan which requires the Corporation to contribute 50% of the pension disbursements made to retired employees. In addition, the Manitoba Hydro Retirement Plan continues to provide benefits to pensioners in respect of service prior to the date each employee entered the Manitoba Civil Service Superannuation Fund.

Actuarial valuations are carried out every three years and provide an estimate of the accrued pension benefits. The next valuations of the Manitoba Civil Service Superannuation Fund and the Manitoba Hydro Retirement Plan are scheduled to be completed as of December 1989 and July 1990, respectively. Based upon formulas provided by the actuaries, the present value of the unfunded accrued pension benefits resulting from the pension plans as at March 31 are:

	1990	1989
	(thousands of dollars)	
Manitoba Civil Service Superannuation Fund	$215 738	$197 197
Manitoba Hydro Retirement Plan	2 968	3 129
	$218 706	$200 326

The present value of the past service benefits, to the extent not previously charged to operations, is recognized in the financial statements as a deferred pension expense and is amortized to pension expense on a sinking fund basis over a 15 year period from April 1, 1988 to March 31, 2003. The pension obligation recognized in the financial statements represents the present value of the unfunded pension liability.

Total pension expense for the year ended March 31, 1990 amounted to $31.7 million (1989 – $29.3 million).

d) **Debt Discount and Expense**

These costs are amortized to finance expense on a straight-line basis over the life of the respective issue.

e) **Discount on Sinking Fund Investments**

The Corporation records sinking fund investments at par value. The difference between the cost and the par value of the investments is recorded as a premium or discount and is amortized on a straight-line basis over the remaining life of the investment. Any gain or loss on early disposal is credited or charged to operations.

f) **Planning Studies Costs**

These costs are recorded as a deferred expense and are amortized to depreciation expense on a straight-line basis over a 15 year period. The unamortized costs of a project which proceeds during the 15 year period are transferred to the capital cost of the project.

g) **Unbilled Revenue**

Revenues are accrued in respect of electricity delivered for those cycles not yet billed.

NOTE 2 — FINANCE EXPENSE

	1990	1989
	(thousands of dollars)	
Interest on debt	$404 212	$381 992
Amortization of debt discount and expense	8 771	7 097
Amortization of foreign exchange gains or losses	516	(4 441)
Finance expense allocated to construction	(97 465)	(75 831)
Investment income	(74 091)	(67 107)
	$241 943	$241 710

NOTE 3 — FIXED ASSETS

	1990		
	Original Cost	Accumulated Depreciation	Construction in Progress
		(thousands of dollars)	
Generation	$1 916 399	$ 485 225	$1 092 927
Transmission	256 927	75 113	16 088
Substations	768 826	229 450	72 980
Distribution	631 968	210 112	11 001
Other	174 218	71 702	13 206
	$3 748 338	$1 071 602	$1 206 202

Construction in Progress includes $1 070 353 thousand (1989 — $842 898 thousand) in respect of the Limestone Generating Station.

	1989		
	Original Cost	Accumulated Depreciation	Construction in Progress
		(thousands of dollars)	
Generation	$1 893 401	$456 677	$850 554
Transmission	246 300	70 878	10 611
Substations	744 961	207 476	28 871
Distribution	581 305	193 695	8 437
Other	153 857	67 842	19 604
	$3 619 824	$996 568	$918 077

NOTE 4 — DEFERRED EXPENSES AND ADVANCES

	1990	1989
	(thousands of dollars)	
Amounts receivable from the Province under the Energy Rate Stabilization Act	$185 595	$127 376
Unamortized planning studies costs	53 635	41 199
Unamortized bond discount and expense	29 473	30 131
Deferred receivables	6 405	4 878
Advance to the Northern Flood Committee Inc. (Note 7b)	4 514	5 231
Unamortized foreign exchange net loss on long-term debt	419	—
Other	6 550	4 906
	$286 591	$213 721

NOTE 5 — LONG-TERM DEBT

Manitoba Hydro's long-term debt is either advanced from or guaranteed by the Province of Manitoba.

As provided by the Manitoba Hydro Act, the Corporation pays an annual sinking fund installment to the Minister of Finance of the Province of Manitoba of not less than 1% of the principal amount of the outstanding long-term debt on the preceding March 31, and 4% of the balance in the sinking fund at such date. Such installments would provide for the full retirement of a debt obligation only if the obligation was outstanding for 41 years. Income earned on sinking fund investments is remitted to the Corporation and is included with investment income for the year.

For the purpose of financing capital construction expenditures and repaying debt during the year, the Corporation arranged long-term financing in the principal amount of $494.6 million as follows:

- $312.4 million Manitoba Hydro Savings Bonds Series 1 due June 15, 1992 with interest at 11.25% during the first year and a minimum rate of 10% for the remaining two years. The bonds are subject to redemption semi-annually until maturity at the option of the bondholder.
- $161.5 million (U.S. $133.6 million) advance from the Province of Manitoba due March 15, 2000 with interest at the six month London Inter Bank Offered Rate less 0.25%.
- Advance from the Province of Manitoba under a loan agreement between the Province and Canada:
  - $2.5 million due March 31, 2016 with interest at 10%
  - $18.2 million due March 31, 2023 with interest at 10%.

Long-Term Debt:	1990	1989
	(thousands of dollars)	
Total long-term debt outstanding —		
The Manitoba Hydro-Electric Board Bonds	$1 192 843	$1 255 659
Advances from the Province of Manitoba represented by debenture debt of the Province	2 707 653	2 692 266
Manitoba Hydro Savings Bonds	286 086	—
Advances from the Province of Manitoba under a loan agreement between the Province and Canada	131 246	112 617
	4 317 828	4 060 542
Less: Sinking fund on deposit with the Minister of Finance	429 391	405 103
	3 888 437	3 655 439
Less: Long-term debt maturing within one year — Maturities net of sinking fund plus annual sinking fund installment	331 811	314 298
	$3 556 626	$3 341 141

Debt Maturities:

			Cash Requirements (thousands of dollars)		
March 31	Principal Amount of Maturities	Weighted Average Coupon Rate	Maturities Net of Sinking Fund	Annual Sinking Fund Installments	Total
1991	$ 304 501		$ 274 636	$ 57 175	$ 331 811
1992	298 970		253 660	55 225	308 885
1993	1 037 933		931 915	52 648	984 563
1994	159 124		110 566	40 145	150 711
1995	265 715		200 703	38 386	239 089
	2 066 243	9.17%	1 771 480	243 579	2 015 059
1996-2000	1 194 503	8.62%	1 005 104	156 865	1 161 969
2001-2005	476 717	9.09%	263 674	105 634	369 308
2006-2010	325 251	8.97%	163 410	40 558	203 968
2011-2015	4 384	9.27%	2 754	31 451	34 205
2016-2023	250 730	9.64%	110 097	30 281	140 378
	$4 317 828		$3 316 519	$608 368	$3 924 887

Long-term debt repayments to be made in Canadian dollars and in foreign currencies, with their Canadian dollar equivalents are shown in the following table (Note 1b):

	1991 to 1995	1996 to 2023	Total	1990	1989
	(in thousands of units)			(in thousands of Canadian dollars)	
Canadian dollars	1 694 698	191 209	1 885 907	$1 885 907	$1 502 459
At book value rates as established by the exposure management program:					
– United States dollars	287 695	1 711 307	1 999 002	2 407 800	–
At rates established according to monetary agreement:					
– United States dollars	13 500	–	13 500	16 304	150 950
At rates in effect at balance sheet date:					
– United States dollars	–	–	–	–	2 000 042
– Swiss francs	10 000	–	10 000	7 817	–
Other foreign currencies in Canadian dollars as established by the Energy Rate Stabilization Act	–	–	–	–	407 091
				$4 317 828	$4 060 542

A portion of the foreign exchange gains or losses on United States and Swiss debt is the responsibility of the Province of Manitoba.

If United States debt recorded at book value rates as established by the exposure management program had been translated at the exchange rate prevailing at the balance sheet date, the total obligation would have decreased by Canadian $68 568 thousand from Canadian $4 317 828 thousand to Canadian $4 249 260 thousand.

NOTE 6 — DEFERRED CREDITS

	1990	1989
	(thousands of dollars)	
Non-refundable capital contributions	$ 97 053	$ 86 837
Unamortized discount on purchase of sinking fund investments	10 616	10 688
Unamortized foreign exchange on sinking fund investments	491	1 233
Unamortized foreign exchange net gain on long-term debt	–	15 256
Other	1 988	1 149
	$110 148	$115 163

NOTE 7 — COMMITMENTS

a) Lease Commitments

In accordance with a lease agreement entered into during 1966 between Canada and the Province of Manitoba, direct current transmission facilities were constructed between the Kettle Generating Station and Winnipeg. The agreement provides for payment by the Corporation of the capital cost with accrued interest at 5.625% over a term of forty-five years in accordance with a payment schedule requiring substantially smaller payments during the earlier years. The schedule provides for payment of $25 852 618 for the year ended March 31, 1990 (1989 – $22 500 000). Payments for the fiscal years 1991 to 2019 are calculated as an equal annual payment of $25 852 618 in order to amortize the outstanding balance over thirty years at 5.625%. The unpaid balance of principal plus accrued interest for transmission facilities amounted to approximately $363 766 000 as at March 31, 1990 (1989 – $368 770 000).

The Corporation's policy is to charge the lease payments to operations in the period in which they become payable. This policy is consistent with the intent of the lease agreement of providing economic relief to ratepayers during the early years of the Nelson River development. This economic relief has been realized and operations are now bearing lease payments which are in excess of the amount that would have been charged to operations had the Corporation adopted the C.I.C.A. recommendation on accounting for those capital leases entered into subsequent to January 1, 1979. If the C.I.C.A. recommendation had been adopted, the amount charged to operations for the year would have been reduced by $0.2 million and an additional net asset amount of approximately $163.6 million would have been recorded relating to the transmission facilities.

b) Mitigation Commitments

i) Churchill River Diversion & Lake Winnipeg Regulation Projects

a) Northern Flood Agreement

Manitoba Hydro is party to an agreement dated December 16, 1977 with Canada, the Province of Manitoba and the Northern Flood Committee Inc., which includes compensation and mitigation for the impact of the Churchill River Diversion and Lake Winnipeg Regulation projects. The total spent on compensation and mitigation during the year was $11.0 million (1989 — $4.8 million). The total amount paid to March 31, 1990 under the Northern Flood Agreement is $47.7 million.

In addition to the above, in 1987 Manitoba Hydro advanced $5.0 million to the Northern Flood Committee Inc. to provide funds to the Indian Bands for their use in housing upgrading. This advance, adjusted for the time value of the advance, will reduce the amounts payable for future adjudicated claims. The balance of the advance at March 31, 1990 is $4.5 million.

Manitoba Hydro, Canada, the Province of Manitoba and the Northern Flood Committee Inc. have entered into negotiations directed towards a global settlement of outstanding obligations. Manitoba Hydro has estimated its contingent liability under global negotiations to be in excess of $85 million. If global negotiations are not successful, Manitoba Hydro would revert to settlement of individual claims on a negotiated or arbitrated basis and the amount of the contingent liability is estimated to be less.

b) Non-Northern Flood Agreement Claims

During the year, Manitoba Hydro paid $2.5 million towards settlement of non-Northern Flood Agreement claims. These claims are submitted directly to Manitoba Hydro for consideration by claimants not party to the Northern Flood Agreement. The total amount paid to March 31, 1990 is $35.4 million. Manitoba Hydro is not able to precisely determine the contingent liability for submitted claims but has estimated it to be in excess of $4.0 million.

ii) Grand Rapids Project

Manitoba Hydro, in conjunction with Canada, the Province of Manitoba and the communities affected by the Grand Rapids hydroelectric development are engaged in a review of the impact of the project on the people of the communities. Manitoba Hydro is not able to determine its contingent liability that may arise from this review.

c) Construction Commitments

Construction on Limestone Generating Station has been committed to provide for first power in November 1990. The current forecasted cost of the new generating station is $1 523.8 million, of which costs of $1 070.4 million have been incurred to March 31, 1990.

Other outstanding commitments, principally for construction, were approximately $184 715 000 (1989 — $157 329 000).

NOTE 8 — RESERVES

The following reserves are maintained by the Corporation:

Contingency and General Reserve

An amount as stipulated by The Manitoba Hydro-Electric Board may be transferred annually to this reserve. No transfers were made during 1990 or 1989.

Rate Stabilization Reserve

The net income (loss) after provision for the contingency and general reserve is transferred annually to this reserve.

NOTE 9 — COMPARATIVE FIGURES

Where appropriate, comparative figures for 1989 have been reclassified in order to conform to the presentation adopted in 1990.

FINANCIAL STATISTICS

(thousands of dollars)

	1990	1989	1988	1987	1986	1985	1984	1983	1982	1981
STATEMENT OF OPERATIONS										
Revenues										
Residential	241 276	223 912	205 388	186 214	176 755	162 422	140 481	122 023	119 474	111 591
General Service and Misc.	305 545	291 614	259 250	227 642	223 198	205 247	180 280	155 864	158 734	138 837
Winnipeg Hydro (Cost Sharing Agreement)	47 469	53 564	43 707	35 415	32 984	29 826	29 398	27 180	33 146	26 682
Extraprovincial	60 089	31 142	66 024	113 489	112 846	103 151	105 654	105 411	72 384	81 965
Construction Power	2 625	1 772	0	0	0	0	0	0	0	0
Other Revenue	7 084	7 497	5 933	6 928	6 820	5 768	5 684	4 217	3 865	2 768
	664 088	609 501	580 302	569 688	552 603	506 414	461 497	414 695	387 603	361 843
Expenses										
Operating and Administrative	248 312	229 691	203 728	187 941	173 866	157 753	148 975	138 503	120 071	105 442
Depreciation—Plant	87 572	82 620	80 109	77 683	74 470	69 339	66 294	61 718	60 127	57 793
Water Rentals	28 855	22 867	26 220	37 582	17 850	11 287	11 760	11 575	9 342	8 956
Fuel and Power Purchased	33 209	59 049	35 330	10 460	9 399	14 392	9 289	8 192	16 711	9 973
Finance Expense	241 943	241 710	253 408	242 574	246 753	242 509	228 853	213 836	205 544	195 947
	639 891	635 937	598 795	556 240	522 338	495 280	465 171	433 824	411 795	378 111
Net Income (Loss)										
Transferred To (From) Reserves	24 197	(26 436)	(18 493)	13 448	30 265	11 134	(3 674)	(19 129)	(24 192)	(16 268)
BALANCE SHEET										
Assets										
Fixed Assets in Service	3 748 338	3 619 824	3 496 495	3 395 825	3 314 378	3 173 197	3 030 182	2 945 435	2 891 325	2 808 938
Less: Accumulated Depreciation	1 071 602	996 568	929 457	854 833	783 776	713 619	647 001	584 534	524 720	469 158
Construction in Progress	1 206 202	918 077	675 323	473 655	326 005	270 947	301 641	272 013	202 544	188 792
Current and Other Assets	811 601	844 369	589 682	225 481	272 648	193 058	249 270	251 561	156 665	121 269
	4 694 539	4 385 702	3 832 043	3 240 128	3 129 255	2 923 583	2 934 092	2 884 475	2 725 814	2 649 841
Liabilities and Reserves										
Long-Term Debt—Net	3 556 626	3 341 141	3 213 030	2 652 128	2 523 786	2 213 115	2 404 657	2 367 561	2 297 887	2 230 803
Current and Other	1 021 338	952 183	500 199	450 693	481 610	616 874	451 082	434 887	326 771	293 690
Reserves	116 575	92 378	118 814	137 307	123 859	93 594	78 353	82 027	101 156	125 348
	4 694 539	4 385 702	3 832 043	3 240 128	3 129 255	2 923 583	2 934 092	2 884 475	2 725 814	2 649 841
STATEMENT OF CHANGES IN FINANCIAL POSITION										
Operating Activities										
Cash from Operations	141 867	79 713	61 829	96 066	107 838	83 839	65 124	48 095	41 844	47 251
Non-Cash Working Capital Increase (Decrease)	10 298	(5 445)	19 076	15 623	(5 099)	(15 013)	10 384	7 819	(5 562)	1 017
From Operating Activities	152 165	74 268	80 905	111 689	102 739	68 826	75 508	55 914	36 282	48 268
Financing Activities										
Proceeds from Long-Term Debt—Net	486 529	484 140	624 245	330 713	380 014	61 002	198 234	273 963	175 393	109 560
Retirement of Long-Term Debt—Net	(282 419)	(179 311)	(107 704)	(92 772)	(170 671)	(84 091)	(175 542)	(75 383)	(67 266)	(51 425)
Sinking Fund Payment	(54 313)	(50 350)	(45 409)	(42 055)	(39 698)	(38 755)	(37 636)	(35 514)	(33 640)	(32 055)
Other	(88 786)	141 959	(25 546)	(91 044)	(19 539)	29 868	37 944	2 563	31 782	10 520
From (To) Financing Activities	61 011	396 438	445 586	104 842	150 106	(31 976)	23 000	165 629	106 269	36 600
Investing Activities										
Additions to Fixed Assets	(426 922)	(380 075)	(311 009)	(237 800)	(202 039)	(122 640)	(152 283)	(128 693)	(103 954)	(99 634)
Other Assets	(15 347)	(12 300)	(6 096)	57	12	14	3 320	22	12	965
To Investing Activities	(442 269)	(392 375)	(317 105)	(237 743)	(202 027)	(122 626)	(148 963)	(128 671)	(103 942)	(98 669)
Increase (Decrease) In Cash	(229 093)	78 331	209 386	(21 212)	50 818	(85 776)	(50 455)	92 872	38 609	(13 801)

OPERATING STATISTICS

	1990	1989	1988	1987	1986	1985	1984	1983	1982	1981
INTEGRATED SYSTEM — MANITOBA HYDRO AND WINNIPEG HYDRO										
Installed Winter Capability (000 kW)	4 048	4 048	4 088	4 088	4 091	4 091	4 091	4 091	4 091	4 091
Manitoba Firm Peak Demand (000 kW)*	3 631	3 407	3 356	3 011	2 941	2 952	2 889	2 543	2 735	2 575
Percentage Change	+6.6	+1.5	+11.5	+2.4	-0.4	+2.2	+13.6	-7.0	+6.2	+2.2
Energy Supplied (000 000 kW.h)										
Manitoba Hydro Generation	18 044	15 327	18 148	22 957	22 226	20 261	20 967	20 538	17 372	17 975
Winnipeg Hydro Generation	1 062	774	710	1 108	1 085	1 066	1 042	1 158	813	848
Energy Purchased										
Hudson Bay Mining & Smelting	0	0	0	0	0	0	0	0	0	37
Saskatchewan	107	66	84	115	93	61	64	71	179	14
United States	1 400	2 264	1 070	0	17	20	7	43	297	201
Total Generated and Purchased	20 613	18 431	20 012	24 180	23 421	21 408	22 080	21 810	18 661	19 075
Firm Energy Supplied for Manitoba Integrated System (000 000 kW.h)*	17 298	17 108	16 260	15 495	15 366	14 993	14 387	13 260	13 527	12 529
Isolated Systems Generated and Purchased (000 000 kW.h)	21	19	20	46	46	47	48	47	46	47
Total Integrated & Isolated Systems (000 000 kW.h)	17 319	17 127	16 280	15 541	15 412	15 040	14 435	13 307	13 573	12 576
Percentage Change	+1.1	+5.2	+4.7	+0.8	+2.5	+4.2	+8.5	-2.0	+7.9	-2.1
MANITOBA HYDRO SYSTEM										
Energy Sold (000 000 kW.h)										
Residential	4 873	4 785	4 416	4 527	4 535	4 355	4 054	3 788	3 643	3 429
General Service and Misc.	7 941	7 857	7 479	7 133	6 893	6 755	6 414	5 860	6 190	5 694
Construction Power	93	86	0	0	0	0	0	0	0	0
Net Transfer to Winnipeg Hydro	1 503	1 726	1 679	1 273	1 190	1 154	1 143	930	1 245	1 163
Extraprovincial										
Ontario	1 796	408	1 004	817	917	795	1 153	850	1 089	1 616
Saskatchewan	20	114	104	10	222	233	269	231	342	968
United States	1 242	694	2 308	7 004	6 153	4 739	5 409	6 533	3 150	3 299
Number of Customers										
Residential	325 727	321 699	316 622	309 723	302 369	297 250	291 260	285 766	284 286	280 725
General Service and Misc.	46 342	45 959	45 822	45 091	44 350	42 908	42 325	42 076	40 693	40 383
Peak Number of Employees	4 310	4 307	4 222	4 142	3 853	3 805	3 778	3 859	3 850	3 899

**Corrected by System Losses applicable to Extraprovincial Sales*

Manitoba Hydro Generating Stations and Capabilities

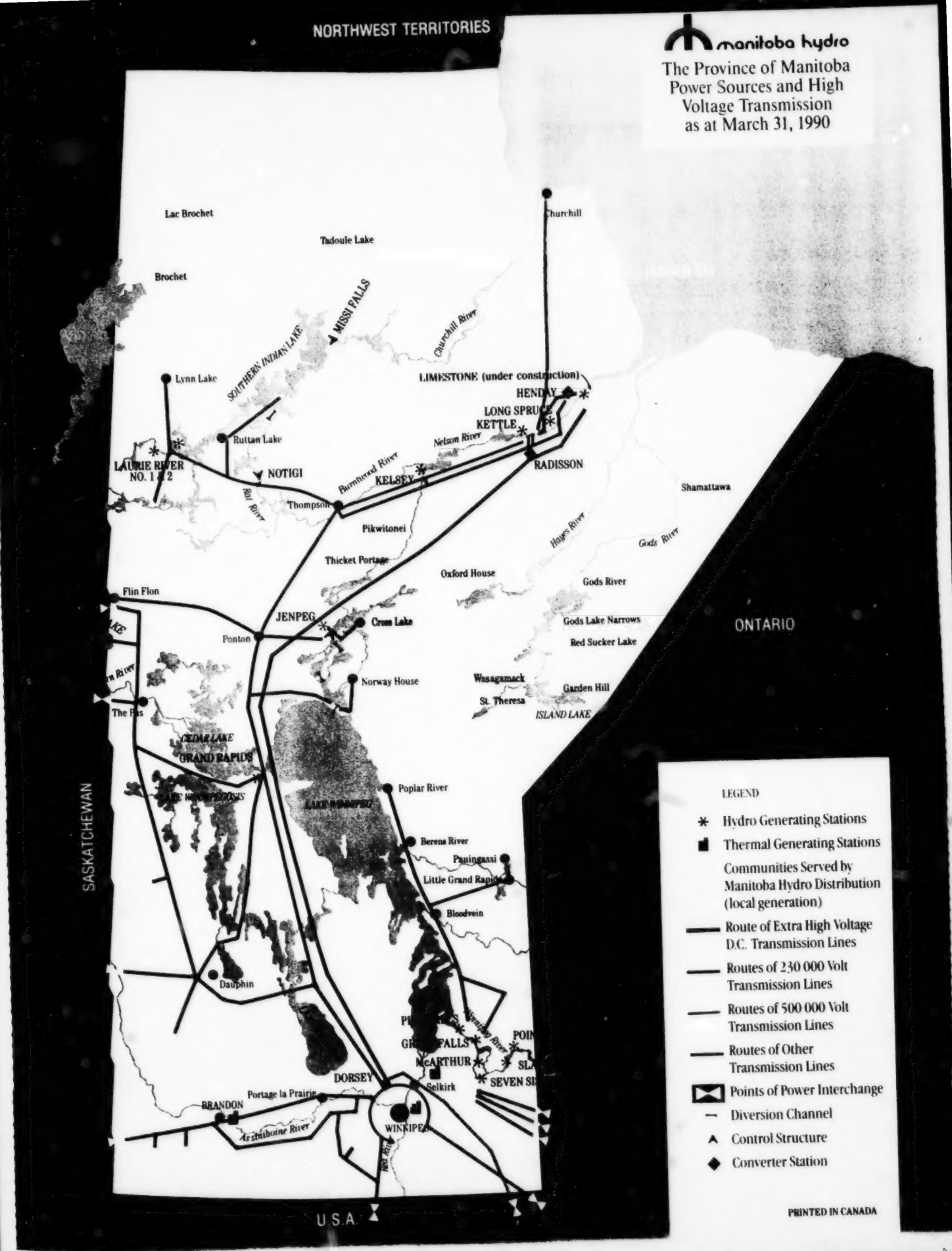
As at March 31, 1990 (Normal Winter Capability)

INTERCONNECTED CAPABILITIES

	STATION	LOCATION	No. of Units	Winter Capability in Kilowatts
HYDRAULIC:	Great Falls	Winnipeg River	6	132 000
	Seven Sisters	Winnipeg River	6	150 000
	Pine Falls	Winnipeg River	6	82 000
	McArthur	Winnipeg River	8	56 000
	Grand Rapids	Saskatchewan River	4	472 000
	Kelsey	Nelson River	7	224 000
	Kettle	Nelson River	12	1 272 000
	Jenpeg	Nelson River	6	126 000
	Long Spruce	Nelson River	10	980 000
	Laurie River (2)	Laurie River	3	10 000
	TOTAL HYDRAULIC			3 504 000
THERMAL:	Brandon		5	237 000
	Selkirk		2	132 000
	TOTAL THERMAL			369 000
	TOTAL			**3 873 000**

ISOLATED CAPABILITIES

DIESEL:	Brochet			825
	Garden Hill			3 665
	Gods Lake Narrows			1 200
	Gods River			525
	Lac Brochet			525
	Oxford House			1 775
	Pikwitonei			500
	Red Sucker Lake			950
	St. Theresa			1 475
	Shamattawa			825
	Tadoule Lake			700
	Thicket Portage			500
	Wasagamack			1 100
	TOTAL			14 565
TOTAL GENERATING CAPABILITY				**3 887 565**



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